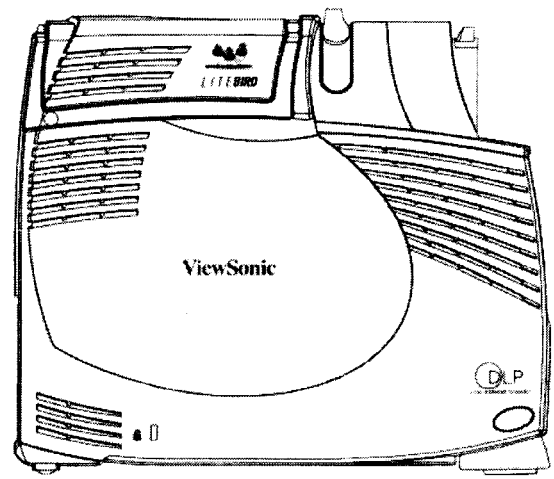
Service Manual

ViewSonic PJ875

Model No. VPROJ22277-1W

Color Super Bright SVGA DMD
L I T E BIRD™ - Micro Portable
Projector



(PJ870_SM_ 211 - Rev. 1 – January 2001)

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Revision History

Revision	Date	Description Of Changes	Approval
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PREFACE

This manual is prepared for the maintenance service for PJ875 Ultraportable SVGA DMD Projector with Zoom Lens. Maintenance procedures described in this manual are intended to isolate faulty parts and replace them in the field. It also aims to serve as a guide in procuring replacement parts for this product.

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This manual includes system overview, major system assembly, components' description, and the "Troubleshooting" making explanations on how to detect errors. It also includes a flow chart for checking or correcting faults.

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CHAPTER 1

INTRODUCTION

This manual is applied to PJ875 Ultraportable SVGA DMD Projector with digital imaging functionality based on Digital Micromirror Device (DMD) technology. It's the mode of single panel, OSRAM 150-Watt P-VIP lamp and 800*600 resolution. The manual gives you a brief description of basic technical information to help in service and maintaining the product.

Your customers will appreciate the quick response time when you immediately identify problems that occur with our products. We expect your customers will appreciate the service that you offer them.

This manual is for technicians and people who have an electronic background. Send the product back to the distributor for repairing and do not attempt to do anything that is complex or is not mentioned in the troubleshooting.

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1-1 PRODUCT FEATURES

- One Panel 0.7" DMD projection system with 720 ANSI lumens, 85% uniformity
- OSRAM 150-Watt P-VIP Lamp
- High efficiency cooling system with system acoustic noise level 43dB typical
- Light weight less than 5.0 lbs
- Manual focus projection zoom lens
- True 800*600 resolution, True colors
- With up, down, left, and right screen reverse
- Build-in full screen NTSC/PAL/SECAM video capability with composite and S-video terminals
- XGA/SVGA/VGA/MAC/PC98/FM Towns compatibility with XGA compression/pan
- Auto image re-sizing to 800*600 full screen
- Auto detection of computer signal input
- Auto Image (Auto-tracking/frequency/positionadjustment)
- Powerful enlarge and freeze function
- Automatically saves adjustments for future use
- On-screen menu with 8 languages
- On screen lamp life timer
- On D-sub PC-data input
- Built-in one speaker with 3-Watt amplifier
- Fan automatic stop after 5 minutes of stand-by mode
- Self protect (45 seconds) timer for hot re-strike of compact UHP lamp
- Wireless remote controller

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1-2 TECHNICAL SPECIFICATION

Dimensions (W*H*D)	3.54*8.58*9.9inches (90*218*252mm)
Weight	5.0 lbs / 2.3 kg
Power Supply	AC input 110-240V, AC 50/60Hz
Video Compatibility	Standards : NTSC M, 4.43 MHz PAL B, D, G, H, I, M, N SECAM B, D, G, K, K1, L
Multimedia Audio	One internal speaker W/ 3 watts output
Power Consumption	180 Watts at normal operation
Projection Lens	F / 2.8 ~ 3.1, f = 31 ~ 40mm
Display Size	17" to 217" (Diagonal)
Projection Distance	3.28ft. to 32.8ft. / 1.0m to 10m

Uniformity	85% by 9pt method Typical
Safety/Regulation	FCC Class A, CE Mark Class B, VCCI-1 UL, CUL, TUV, BSMI
Displayable Color	16.7Million colors (8 bits per color)
Display	Digital Light Processing™ (DLP) technology by Texas Instruments
Zoom Factor	1.3X

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Throw Ratio 2.24 ~ 2.91

Projection Distance	*Image Size Range*
1.0m	0.4m - 0.6m
2.0m	0.8m - 1.1m
3.0m	1.3m - 1.7m
4.0m	1.7m - 2.2m
5.0m	2.1m - 2.8m
6.0m	2.6m - 3.3m
7.0m	3.0m - 3.9m
8.0m	3.4m - 4.4m
9.0m	3.8m - 5.0m
10.0m	4.2m - 5.5m

Aspect Ratio 4 : 3

Display Resolution 800 pixels (H)*600 lines (V)

Horizontal Scan Rate 15 ~ 69 kHz

Vertical Refresh Rate 43 ~ 85 Hz

Lamp Type OSRAM 150-Watt P-VIP

Lamp Life 1,500 hours to 50% survival

MTBF 12K hours

Color Temperature 9972°K Typical

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1-3 ENVIRONMENTAL SPECIFICATION

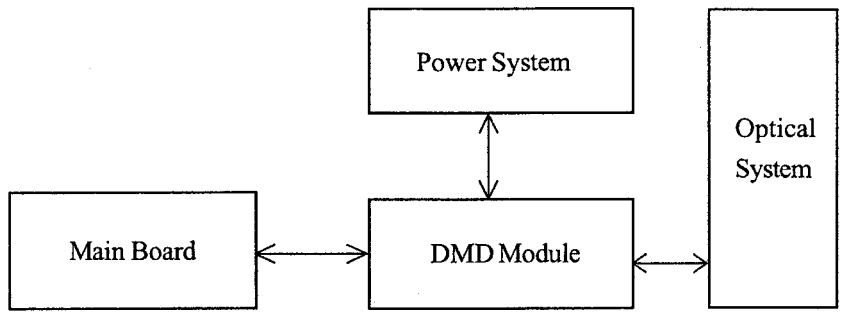
Temperature	Operating : 10°C to +40°C / 50°F to 104°F Storage : -20°C to +60°C / -4°F to 140°F
Max. Humidity	Operating : 10% to 85% Non-Condensing Storage : 10% to 85% Non-Condensing
Altitude	Operating : 0 to 10,000 ft @25°C Storage : 40,000 ft
Noise level	43db Typical @23°C

CHAPTER 2

FUNDAMENTAL PRINCIPLES

This section provides the conceptual drawing about optics of projector. You can realize optical projection system through the following diagram and also the integral part of configuration.

2-1 WHOLE SYSTEM BLOCK DIAGRAM



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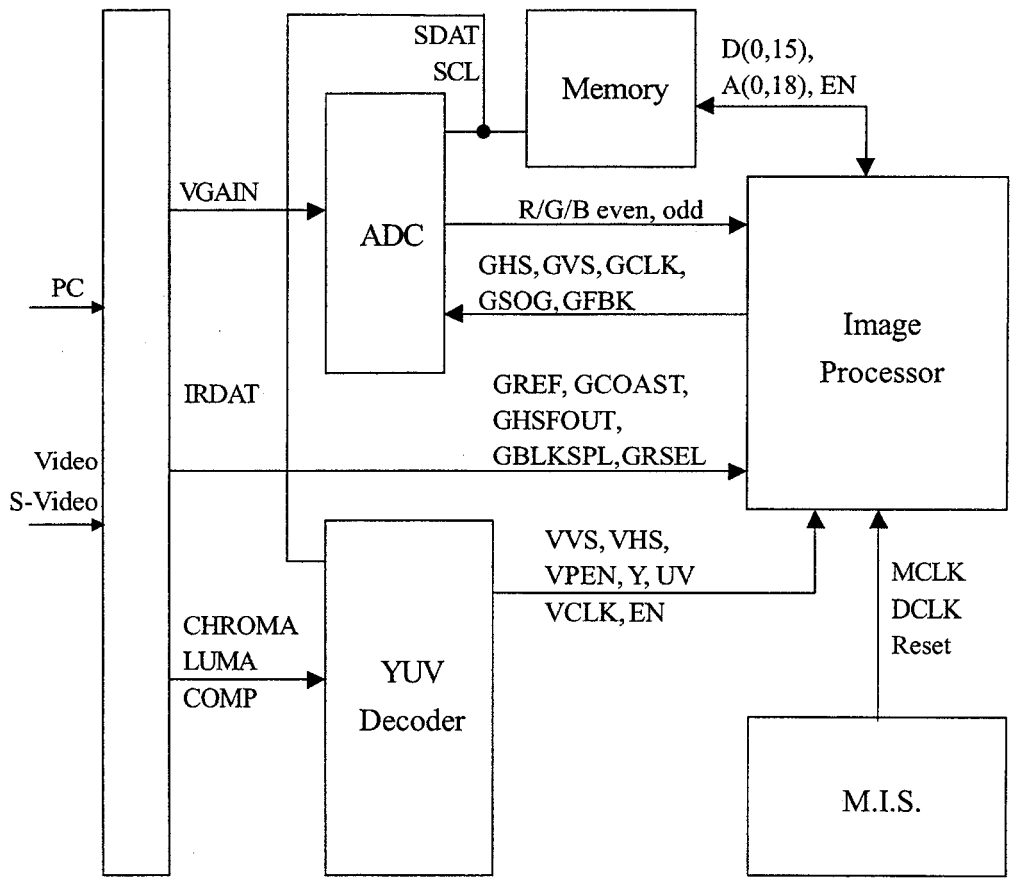
2-1.1Main Board Block Diagram



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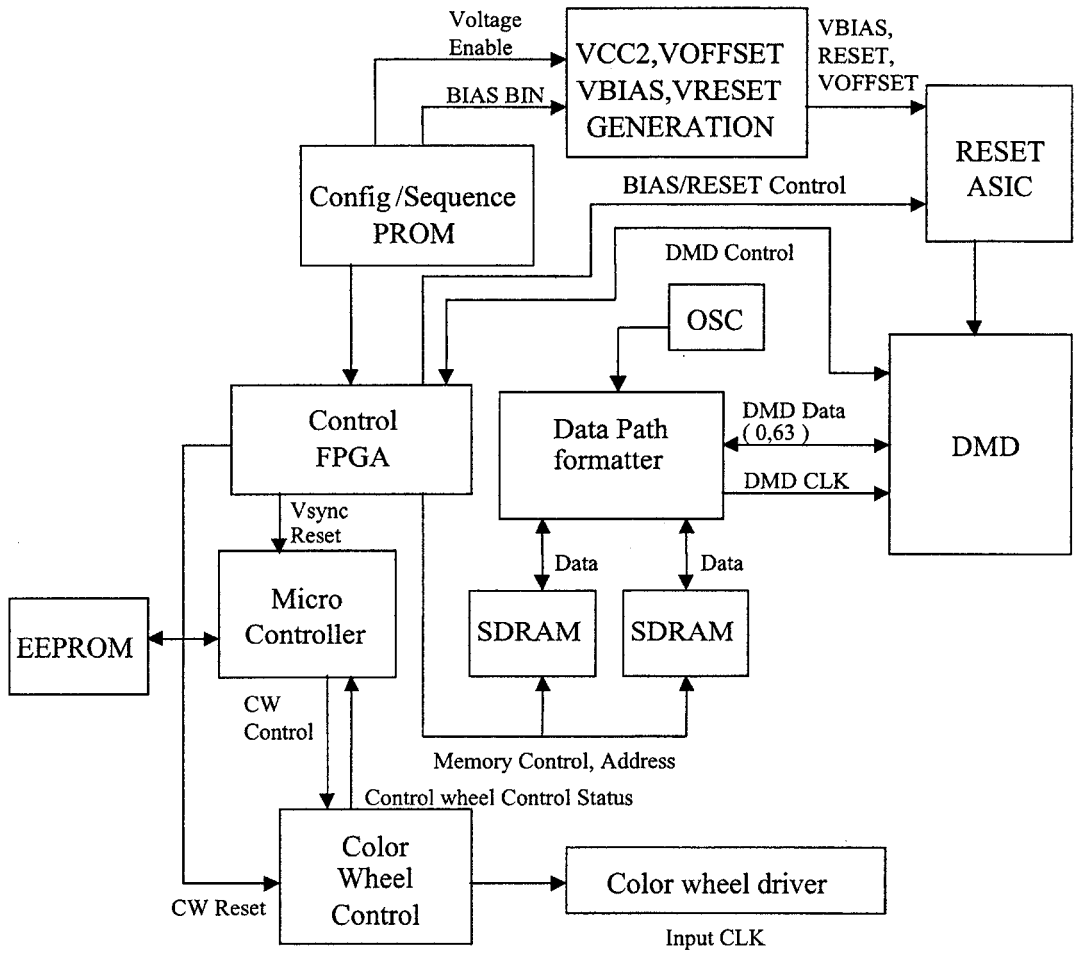
2-1.2 DMD Module Block Diagram



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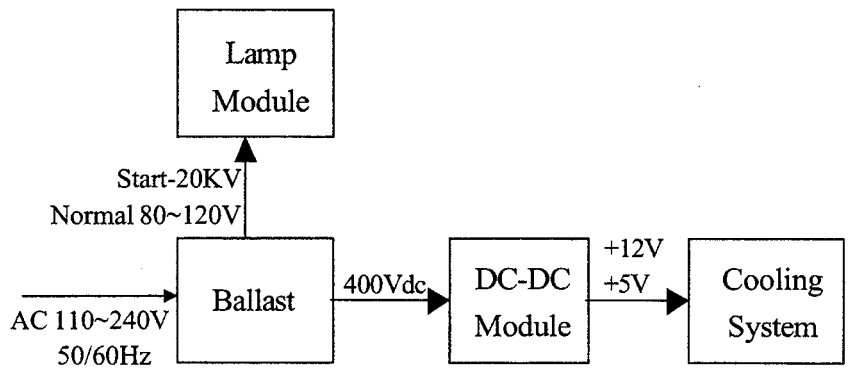
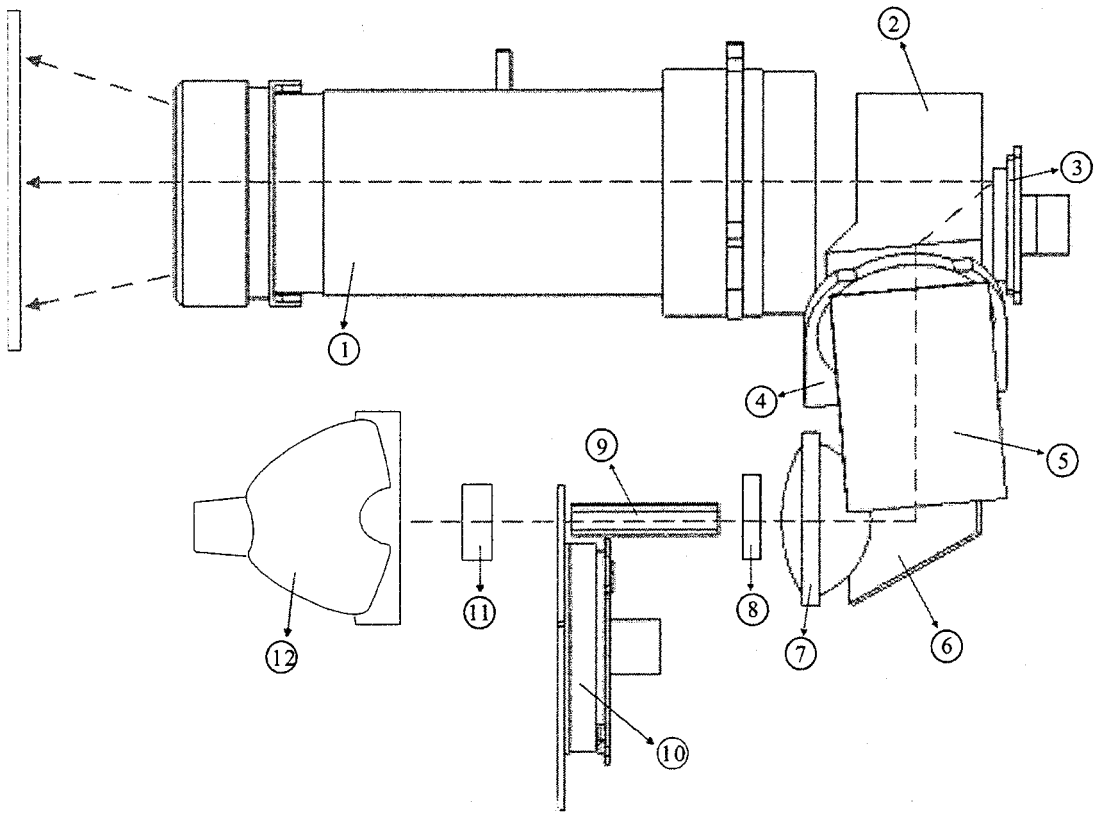
2-1.3 Power System Block Diagram



2-2 OPTICS

2-2.1 Conceptual Drawing



1. Zoom Projection Lens
2. DLP TIR Prism
3. DMD Module
4. Plastic (PMMA) Relay Lens
5. Enhance Mirror
6. Enhance Mirror
7. Plastic (PMMA) Condenser Lens
8. UV-IR Filter
9. Hollow Integration Rod
10. Color Wheel
11. AR Coating Plate
12. OSRAM Elliptical Reflector P-VIP Lamp 150W

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2-2.2 Basic Functions

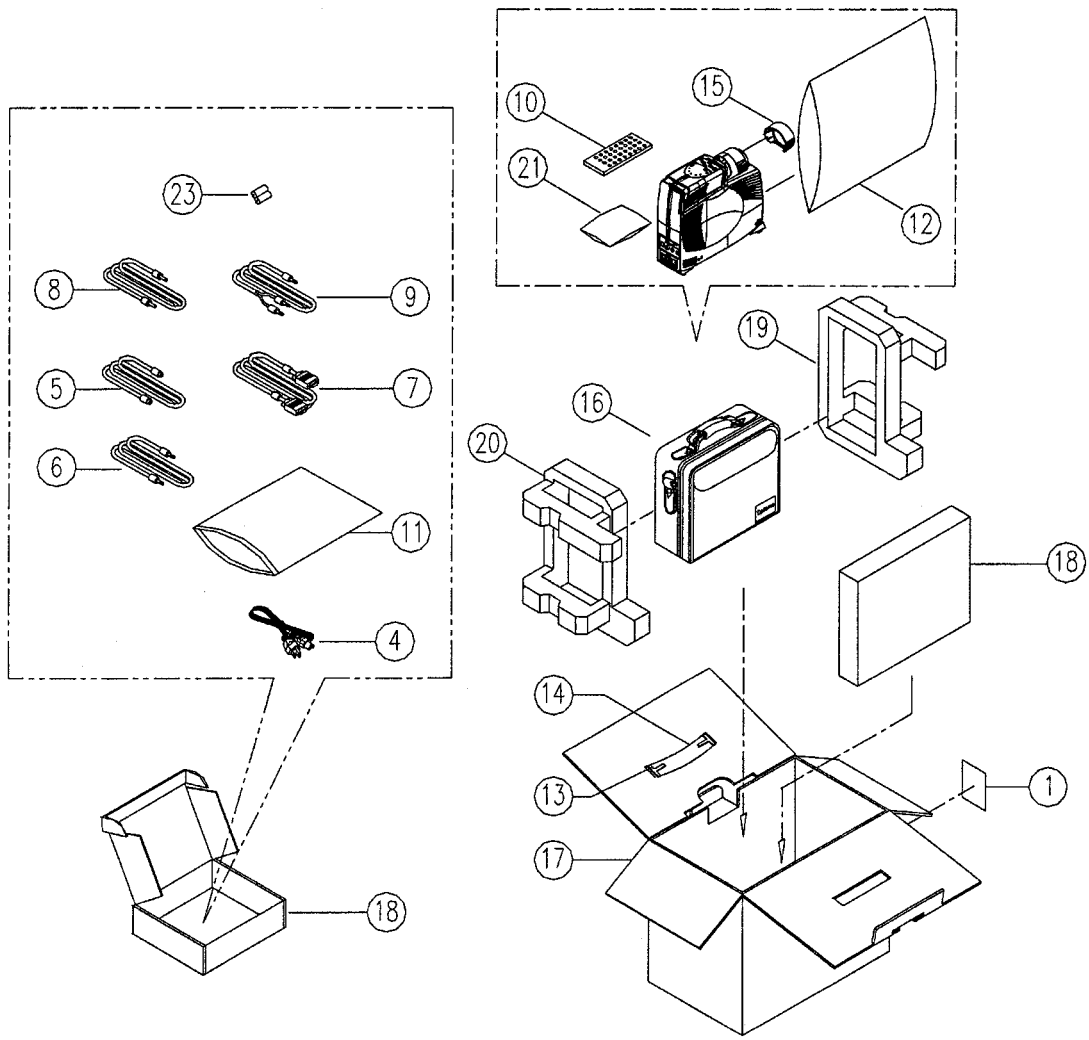
◆ *Zoom Projection Lens*	Projecting image on the screen
◆ *DLP TIR Prism*	Reflecting all light beams inside.
◆ *DMD Module*	Displaying component.
◆ *Plastic (PMMA) Relay Lens*	Lengthening optical path.
◆ *Enhance Mirror*	Folding optical path.
◆ *Plastic Condenser Lens*	Condensing the light beam.
◆ *UV-IR Filter*	Filtering UV-IR out.
◆ *Hollow Integration Rod*	Making the light beam uniform.
◆ *Color Wheel*	Separating the light beam into and produce R.G.B colors.
◆ *AR Coating Plate*	Protecting system components if the lamp explode.
◆ *Elliptical Reflector P-VIP Lamp 150W*	The light source.

CHAPTER 3

MECHANICAL CONSTRUCTION

This section provides the package and exploded overview, replaceable parts list and recommendation parts list for the DMD projector. You can place an order for correct parts in the recommendation parts list.

3-1 PACKAGE OVERVIEW



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3-1.1 Replacement Parts List

Item	P/N	Description
1	35.82001.111	Label Carton 3"*3"
*	35.81403.111	Label AV Connector
*	35.82002.111	Label ThreeBird
4	42.81505.041	Cable Power Cord AC C5 3P#18/SPT-2 UNSHLD10ft Black (N.A.)
5	42.50209.011	Cable S-VHS 2M
6	42.50705.001	Cable Mini Jack to Mini Jack
7	42.53001.051	Cable VGA 15P 1.8M
8	42.50110.002	Cable RCA 1500mm LPP-Video
9	42.50704.001	Cable Mini Jack to RCA 2M
10	45.82001.111	Remote Controller
11	51.00027.001	PE Bag Zipper 33cm*25cm
12	51.81537.001	ESD Bag LDPE 300*400*0.1mm
13	51.81529.001	Handle Upper Carry-Box
14	51.81530.001	Handle Lower Carry-Box
15	51.82005.111	New Lens Cap
*	51.82008.111	Snap Rivet SR-3Q
16	53.81401.101	Carry Bag PVC Cloth
17	55.82003.711	Carton Carry Box
18	55.81402.001	Carton Pizza Box
19	56.81401.001	Cushion Left
20	56.81402.001	Cushion Right
21	57.00001.001	Pack SiO2 Drier 20g
23	46.80301.001	Battery #4 1.5V

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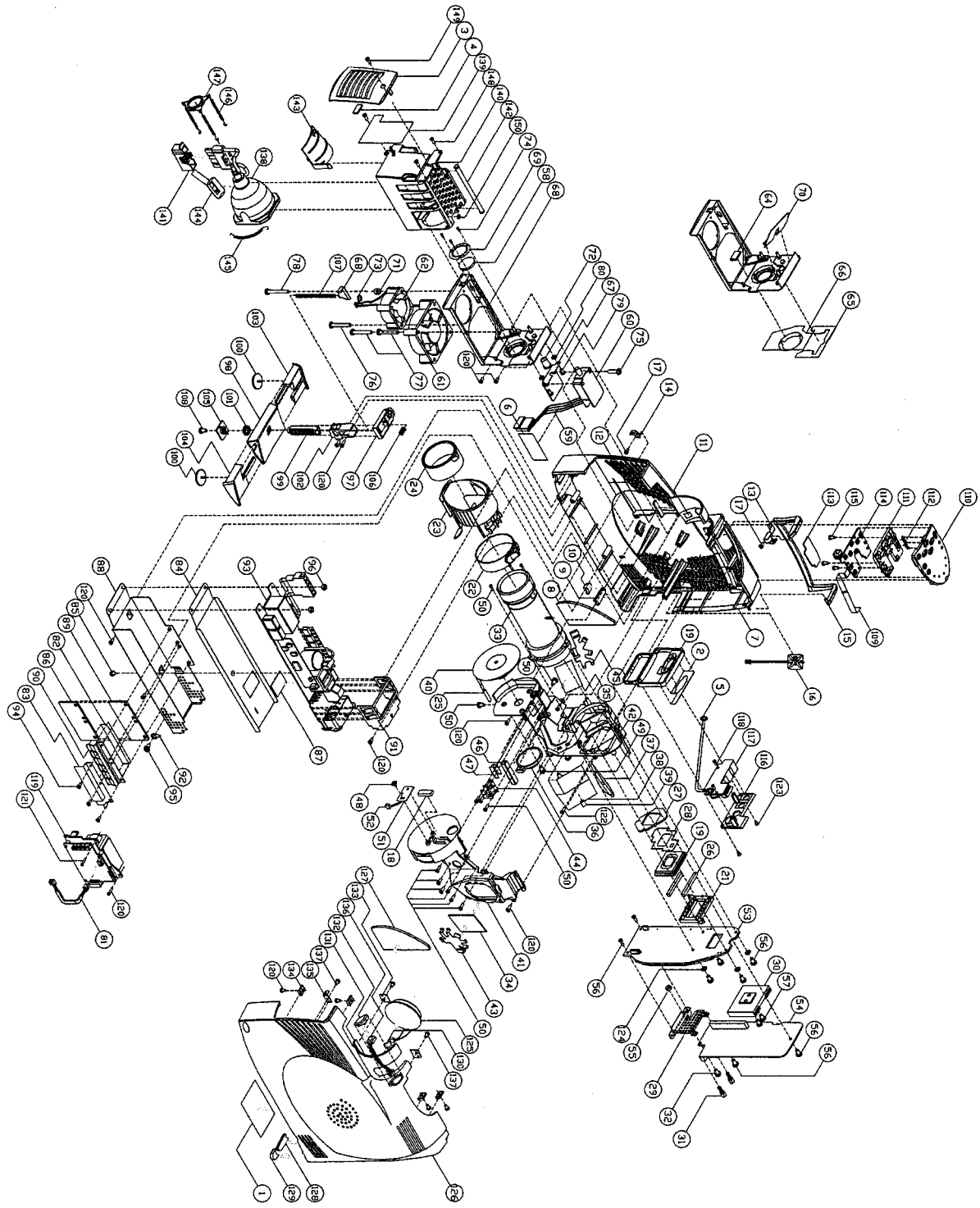
3-2 EXPLODED OVERVIEW



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3-2.1 Replacement Parts List

Item	P/N	Description
1	35.81406.001	Label Spec 32*106
2	35.81402.111	Label VGA CNNT
3	51.82004.111	Lamp Cover
4	52.82909.001	Pad for Lamp Cover
5	42.81402.001	Ground Cable
6	51.81540.001	Tape 3M J350 17*60mm
7	51.81401.111	Left Cover
8	51.81427.002	Thermal Insulator-Left
9	52.81402.001	Rear Rubber Foot
10	52.81406.001	Rubber Foot EXTN Clear
11	52.82907.001	Wearproof Pad for Lens Zoom Adjuster
12	52.82908.001	Resist Wind for Lens Cover
13	61.81403.001	Handle Holder BRKT SUS 0.8t
14	61.81407.001	Lamp Changer BRKT-Left SUS 0.8t
15	61.81417.111	Handle Metal
16	75.81403.001	ASSY Thermistor Module
17	85.1A126.040	Screw Pan Mech M2.6*4
18	43.82201.002	Thermal Switch with VHB4930 SEKI ST-22 130°C
19	51.81407.111	IO Box
20	48.817DM.D01	DMD 8460 848*600 Pixel MPC
21	51.81701.001	Elastomer Holder for DMD
22	51.82001.002	Lens Zoom Adjuster
23	51.82002.111	Zoom Lens Cover
24	51.82003.001	Zoom Lens Focus Adjuster
25	52.81515.001	Insulator Sumitube
26	52.81701.001	Zebra Elastomer
27	52.81702.002	DMD Dust Protect Rev.B
28	52.81709.001	PP Mask
29	61.81402.001	Main Board BRKT SUS 0.8t
30	61.81703.001	Heat Sink for DMD

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Item	P/N	Description
31	85.005AG.075	Hex I/O 4-40UNC*H5*L7.5
32	85.1A126.060	Screw Pan Mech M2.6*6
33	23.81801.001	DLP XGA Optical Zoom Projection Lens
34	23.81502.001	BALZERS SILFLEX Enhance Mirror 44*32mm
35	23.81502.011	BALZERS SILFLEX Enhance Mirror 36*24mm
36	23.81716.001	Plastic Condenser Lens for SVGA 17uDMD
37	23.81516.011	Plastic (PMMA) Relay Lens for DLP
38	23.81718.001	DLP TIR Prism BK7 for 0.7" DMD
39	52.81508.001	PORON for Prism
40	23.81819.001	R105 G110 W40 B105 Φ50mm Color Wheel Joplin
41	51.81518.101	Optical Engine Top Case
42	61.81503.102	Optical Engine Base
43	61.81511.001	Spring for Enhance Mirror 44*32mm SUS301 0.25t
44	61.81509.001	Spring for Rod SUS301 0.25t
45	61.81510.001	Spring for Enhance Mirror 36*24mm SUS301 0.25t
46	23.81817.002	Hollow Intergration Rod 5.3*4.0*28.65mm
47	61.81701.002	Hollow Rod Holder
48	85.WA126.050	Screw Pan Tap M2.6*5
49	85.0A523.050	Screw Pan Mech M3*5
50	85.1A125.060	Screw Pan Mech M2.5*6
51	80.81803.001	PCBA Sensor Board Rev.A
52	42.81504.001	W.A. 3P #24 120mm
53	80.81705.001	PCBA DMD Board
54	80.82001.001	PCBA Main Board
55	86.0A126.018	Nut Hex M2.6*0.45P
56	85.0A523.050	Screw Pan Mech M3*5
57	85.4B9AF.032	Screw Pan Mech #6-32*1/2
58	23.82220.001	Plate Glass Φ21mm t2mm UV-IR Coating BK7
59	42.81502.004	W.A. 4P of Interrupter Switch
60	43.80713.102	Switch Interrupter

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Item	P/N	Description
61	49.81401.002	CHENG Home DC Brushless Fan CHA6012DB 60*60*23mm
62	49.81502.004	SUNON 40*20mm VAPO Fan
63	51.00001.001	Cable Tie
64	51.81432.001	Fan Insulator Pad-S Silicone 12*7*2t
65	52.82901.001	Insulator-Up for Lamp Fan Holder
66	52.82902.001	Insulator-Mid for Lamp Fan Holder
67	61.81404.002	Interrupt & Blower Fan BRKT Al 0.8t
68	61.81409.003	Lamp Fan Holder
69	61.82001.001	Bracket for Condenser SUS 0.3t
70	61.82002.001	Wind Guider 0.6t
71	61.82003.001	Spacer for Fan Copper
72	61.81412.001	Interrupter Safety Ring
73	61.81413.002	Elevator Spring Bracket 0.8t
74	85.4A322.040	Screw Flat Mech M2*4
75	85.1A123.120	Screw Pan Mech M3*12
76	85.1A223.230	Screw Pan Mech M3*23
77	85.1A523.260	Screw Pan Mech M3*26
78	85.1A123.192	Screw Pan Mech M3*19.2
79	85.1A523.080	Screw Pan Mech M3*8
80	87.FL031.005	Washer Flat 5.5*3.0*0.5t
81	42.81514.001	W.A. 3P #24 65mm
82	51.81525.001	Insulator for Clip FRPP
83	51.81532.002	Insulator for MOS FRPP
84	51.81425.001	Mylar Electrical Insulator for Ballast
85	51.81426.001	Spacer Support
86	52.81403.002	Thermal Pad (86/225, t0.8, K+1.5W/m.K) MOS
87	52.81405.001	Thermal Pad 28*20*2t
88	61.81401.004	Ballast BRKT Al 0.8t
89	61.81405.001	Trainsistor Heat Sink Al 2.0t
90	61.81508.101	Trainsistor Clip SUS 0.8t

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Item	P/N	Description
91	61.81516.102	EMI Can Tin Plate 0.5t
92	61.81523.001	Terminal Grounding for Ballast
93	76.82901.001	ASSY Ballast OSRAM PT VIP150 Flickerless
94	85.1A126.060	Screw Pan Mech M2.6*6
95	85.1C127.060	Screw Pan Mech W/T M3.5*6
96	86.0A123.032	K Nut M3*0.5P L3.2
97	51.81415.001	Elevator Push Button
98	51.81416.111	Elevator Body Housing
99	51.81417.002	Elevator Bolt Nylon+Fiber
100	51.81418.111	Elevator Foot
101	51.81419.111	Elevator Gear
102	51.81420.001	Elevator Holder
103	51.81421.112	Elevator Left Extension
104	51.81422.112	Elevator Right Extension
105	51.81423.112	Elevator Gear Cover
106	61.81411.001	Elevator Spring SUS304 Φ0.5/OD6.1/L8.5
107	61.81414.001	Elevator Extent Spring SUS304 φ0.5/OD4.5/L57
108	85.0A523.050	Screw Pan Mech M3*5
109	42.81401.001	Cable FPC 16P 0.5mm
110	51.81403.113	Control Panel
111	51.81404.002	KeyPad
112	51.81405.001	LED Lens PC Clear
113	52.82905.001	Resist Light for Keypad Rubber
114	80.81402.001	PCBA KeyPad Board
115	85.WA126.050	Screw Pan Tap M2.6*5
116	51.81408.111	AV Cover
117	80.81403.001	PCBA A/V Board
118	85.WA126.080	Screw Pan Tap M2.6*8
119	75.82001.001	ASSY DC/DC Power with Fan Speed Control Rev.B
120	85.1A126.060	Screw Pan Mech M2.6*6

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Item	P/N	Description
121	85.1A126.070	Screw Pan Mech M2.6*7
122	85.WA126.080	Screw Pan Tap M2.6*8
123	85.YA323.060	Screw Flat Tap M3*6
124	87.FL030.003	Washer Flat 7*3.2*0.25t with Adhesive
125	49.81402.002	Speaker D50 H=20mm 6W 8V
126	51.81402.711	Right Cover
127	51.82902.001	Right Insulator
128	52.81402.001	Rear Rubber Foot
129	52.81406.001	Rubber Foot EXTN Clear
130	52.82907.001	Wearproof Pad Lens Zoom Adjuster
131	52.82908.001	Resist Wind for Lens Cover
132	51.82904.001	IR Lens PC
133	61.81104.001	Speaker Holder SECC 1.0t
134	61.81406.002	Nut Plate M2.6 K7 0.5t
135	61.81408.001	Lamp Changer BRKT-Right SUS 0.8t
136	75.82002.001	ASSY IR Receiver Module
137	85.1A126.040	Screw Pan Mech M2.6*4
138	23.82915.001	OSRAM 150W Elliptical Reflector UHP Lamp
139	35.82902.111	Label Caution Hight Voltage & Temperature
140	51.81412.005	Lamp Changer
141	51.81413.001	Lamp CNNT Cover
142	51.81414.001	Switch Bar
143	51.82901.001	Wind Fan Guider
144	52.81510.002	Silicon Rubber for Lamp
145	61.81415.001	Spring EXTN SUS304 W0.5/3.2D*78L
146	61.81519.001	Spring EXTN SUS304 F0.5/3.2D*22/42~56L
147	61.81520.001	Lamp-Collar SUS301 17.8d/25.2D 3HoleF2.0
148	85.1A126.060	Screw Pan Mech M2.6*6
149	85.1A126.100	Screw Pan Mech M2.6*10
150	87.FL020.003	Washer Flat 5*2*0.3t

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3-3 RECOMMENDATION SPARE PARTS LIST

3-3.1 Spare Parts List

Item	P/N	Description	Type
1	70.82707.111	ASSY Left Cover Module (Assembly item 7~17)	SW
2	70.82702.001	ASSY Engine Module (Assembly item 27~41)	SW
3	80.81803.001	PCBA Sensor Board Rev.A	SW
4	70.81712.001	ASSY DMD Module	SW
5	80.82001.001	PCBA Main Board	SW
6	70.82904.001	ASSY Ballast Module (Assembly item 81~96)	SW
7	70.81406.111	ASSY Elevator Module (Assembly item 97~108)	SW
8	51.81403.113	Control Panel	CM
9	80.81402.001	PCBA Keypad Board	SW
10	80.81403.001	PCBA A/V Board	SW
11	75.82001.001	ASSY DC-DC Power With Fan Speed Control	SW
12	49.81402.002	Speaker D50 H=20mm 6W 8Ω Y&W	CM
13	51.00003.001	Tie Mounts PG-FW-2M	CM
14	51.81402.711	Right Cover	CM
15	51.82902.001	Insulator-Right	CM
16	51.82904.001	IR Lens PC Red	CM
17	75.81403.001	ASSY Thermistor Module	CM
18	75.82002.001	ASSY IR Receiver Module	CM
19	70.82906.711	ASSY Lamp Changer Module(Assembly item 138~150)	SW
20	51.82005.111	New Lens Cap	CM
21	51.82008.111	Snap Rivet SR-3Q Black	CM
22	85.0A523.050	Screw Pan Mech M3*5	CM
23	85.1A123.120	Screw Pan Mech M3*12	CM
24	85.1A123.192	Screw Pan Mech M3*19.2	CM
25	85.1A126.040	Screw Pan Mech M2.6*4	CM
26	85.1A126.060	Screw Pan Mech M2.6*6	CM
27	85.1A126.070	Screw Pan Mech M2.6*7	CM
28	85.1A126.100	Screw Pan Mech M2.6*10	CM

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Item	P/N	Description	Type
29	85.1A223.230	Screw Pan Mech M3*23 Color	CM
30	85.1A523.260	Screw Pan Mech M3*26	CM
31	85.1A523.080	Screw Pan Mech M3*8	CM
32	85.4A322.040	Screw Flat Mech M2*4 Black	CM
33	85.4B9AF.032	Screw Flat Plastic #6-32*1/2	CM
34	85.WA126.050	Screw Pan Tap M2.6*5	CM
35	85.WA126.080	Screw Pan Tap M2.6*8	CM
36	85.YA323.060	Screw Flat Tap M3*6 Black	CM
37	86.0A126.018	Nut Hex M2.6*0.45P	CM
38	87.FL030.003	Washer Flat 7*3.2*0.25t with Adhesive	CM
39	87.FL031.005	Washer Flat 5.5*3.0*0.05t	CM
40	61.00002.011	Hex I/O 4-4OUNC*H5*L9.0	CM
41	42.50209.011	Cable S-VHS 2M	CM
42	42.53001.051	Cable VGA 15P 1.8M Black	CM
43	42.50110.002	Cable RCA 1500mm LPP-Video	CM
44	42.50704.001	Cable Mini Jack to RCA 2M	CM
45	42.50705.001	Cable Mini Jack to Mini Jack	CM
46	42.82001.041	Cable Power Cord AC 10ft 105°C Black (NA)	CM
47	36.82701.012	User's Manual Multilingual ViewSonic PJ875	CM
48	45.82001.111	Remote Controller	CM
49	53.81401.101	Carry Bag PVC Cloth	CM
50	35.82001.111	Label Carton 3"*3"	SW
51	35.82002.111	Label Threebird	CM
52	35.81403.111	Label AV CNNT	CM
53	51.00027.001	PE Bag Zipper 33cm*25cm	CM
54	51.81537.001	ESD Bag 300*400*0.1mm	CM
55	51.81529.001	Handle Upper Carry Box	CM
56	51.81530.001	Handle Lower Carry Box	CM

Item	P/N	Description	Type
57	55.82003.711	Carton Carry Box	CM
58	55.81402.001	Carton Pizza Box	CM
59	56.81401.001	Cushion Left	CM
60	56.81402.001	Cushion Right	CM
61	57.00001.001	Pack SiO2 Drier 20g	CM

Note : *SW = Swap Spare Parts, CM = Consume Spare Parts. You can place an order for swap or consume spare parts to do replacement. Or just return swap spare parts back for repair, but consume spare parts is not acceptable for repair or return.*

SW is repairable, when it's defective please return back the defective but complete parts to swap for new parts. Regarding CM, it's not repairable and you should give the order to do replacement and discard the defective parts directly.

The recommendation spare parts list is built for the convenience of disassembly procedure. If there is any comment or recommendatin on the item of SW or CM, please let us know.

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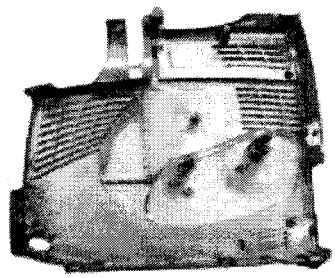
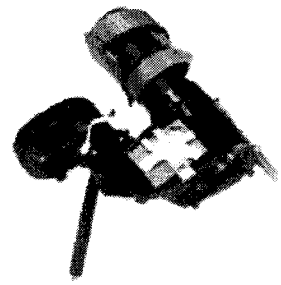
3-3.2 Spare Parts Illustration

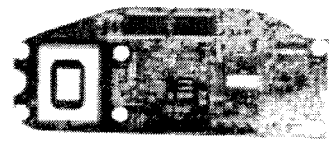


70.82707.111 ASSY Left Cover Module

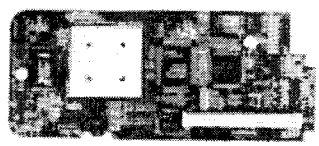


70.82702.001 ASSY Engine Module

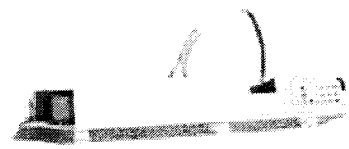
80.81803.001 PCBA Sensor Board



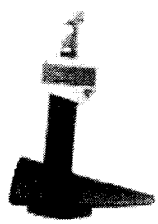
70.81712.001 ASSY DMD Module



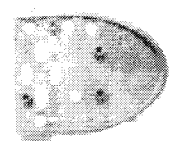
80.82001.001 PCBA Main Board



70.82904.001 ASSY Ballast Module



70.81406.111 ASSY Elevator Module



51.81403.113 Control Panel

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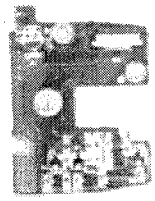
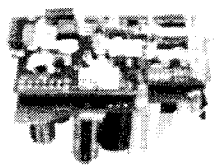
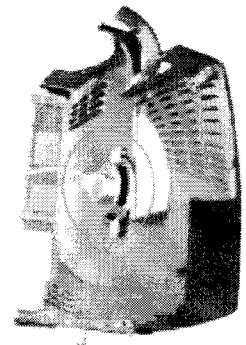


80.81402.001 PCBA Keypad Board

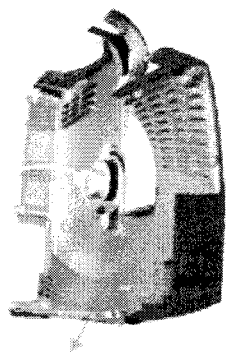
80.81403.001 PCBA A/V Board



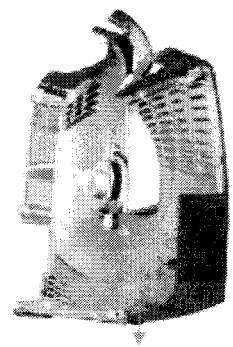
75.82001.001 ASSY DC-DC Power



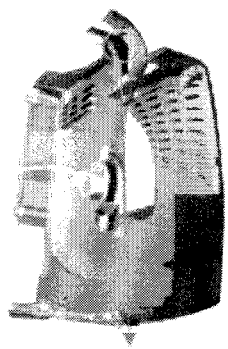
49.81402.002 Speaker



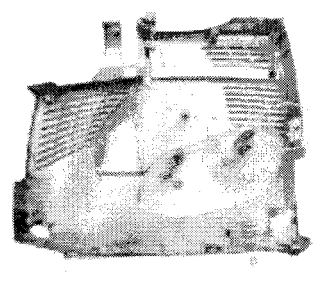
51.81402.711 Right Cover



51.82902.001 Insulator Right



51.82904.001 IR Lens



75.81403.001 ASSY Thermistor Module

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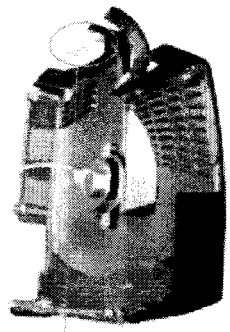
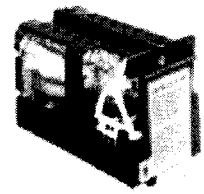


75.82002.001 ASSY IR Receiver Module



70.82906.711 ASSY Lamp Changer Module

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CHAPTER 4

PROCEDURE OF DISASSEMBLY

This section provides disassembly procedures for PJ875 0.7"*1 DMD SVGA Color Projector. Before you begin any of these procedures, be sure to turn off the power, computer system, and other attached devices; then disconnect the power cable from the electronically outlet. Moreover, when you disassemble the projector, be sure to put the screws in a safe place and separate them according to grouping.

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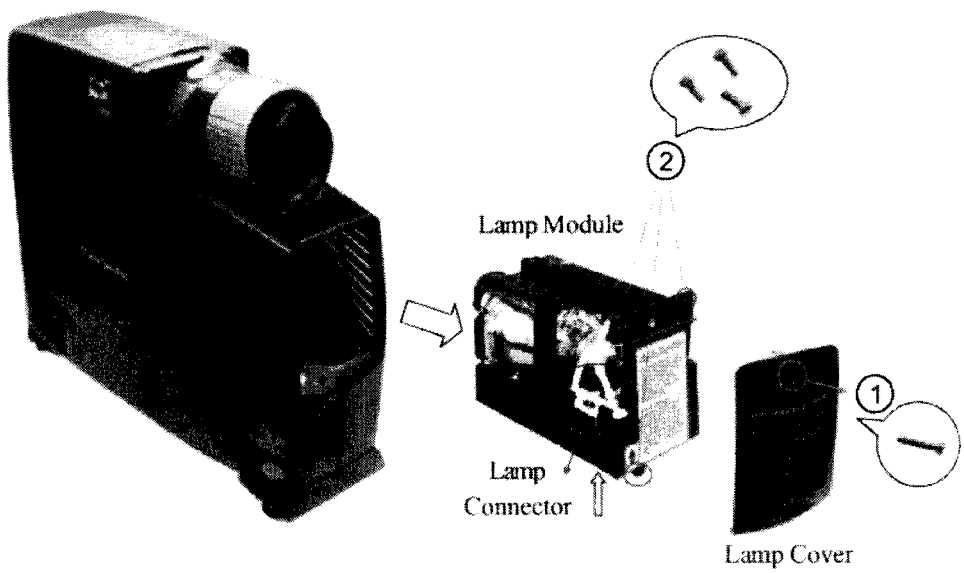
Tools : 1. Philips Screw Driver (Size : 101 & 107)
2. Hexagon Nut Spinner (Size : 5mm)
3. Nose pliers

4-1 DISASSEMBLY OF LAMP MODULE



1. Unscrew one screw(85.1A126.100 Pan Mech M2.6*10) to take off Lamp Cover.

2. Unscrew three screws(85.1A126.060 Pan Mech M2.6*6) and push Lamp Connector upward to remove Lamp Module.

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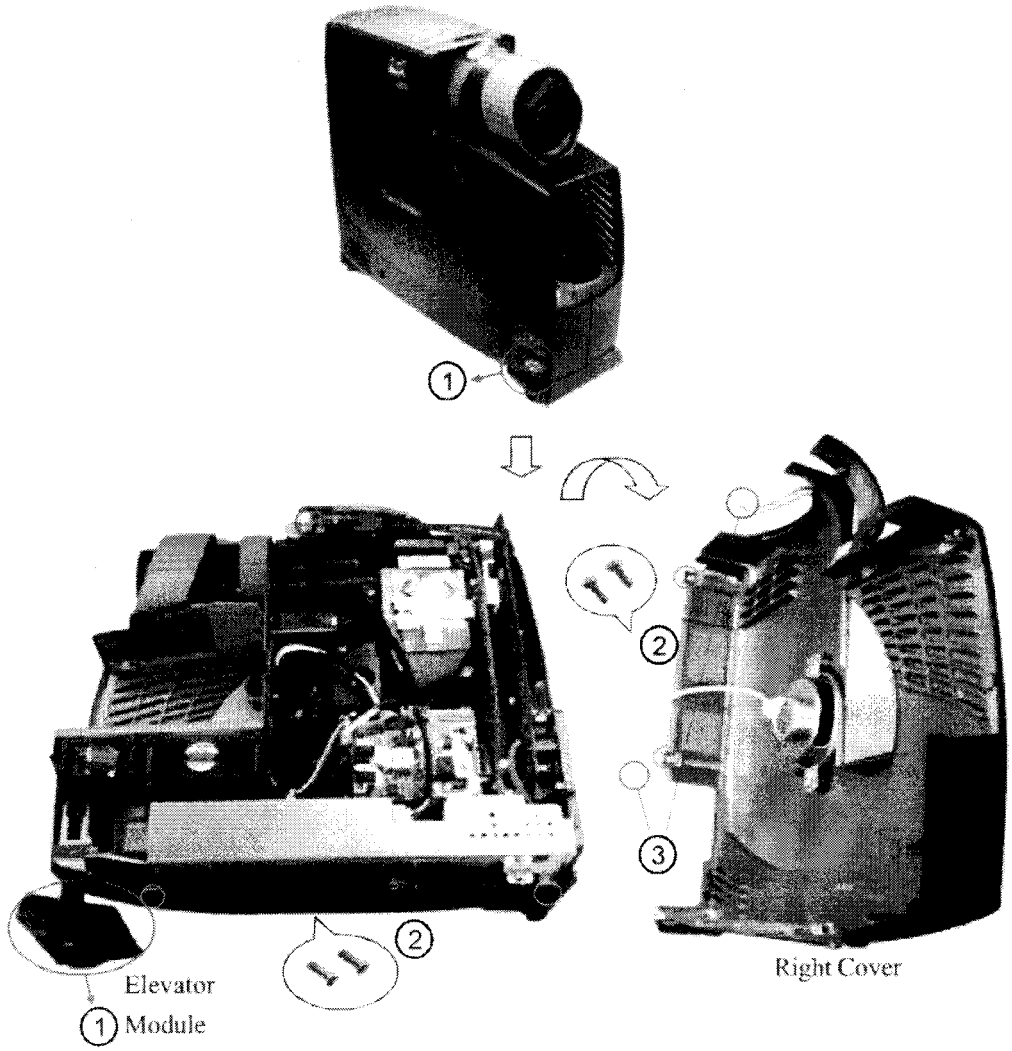
4-2 Disassembly of Right Cover



1. Press the blue button to spring out Elevator Module.

2. Unscrew two screws(85.1A126.060 Pan Mech M2.6*6) on the bottom and two screws(85.1A126.060 Pan Mech M2.6*6) on the rear side of Projector.

3. Lift Right Cover and unplug two cables.

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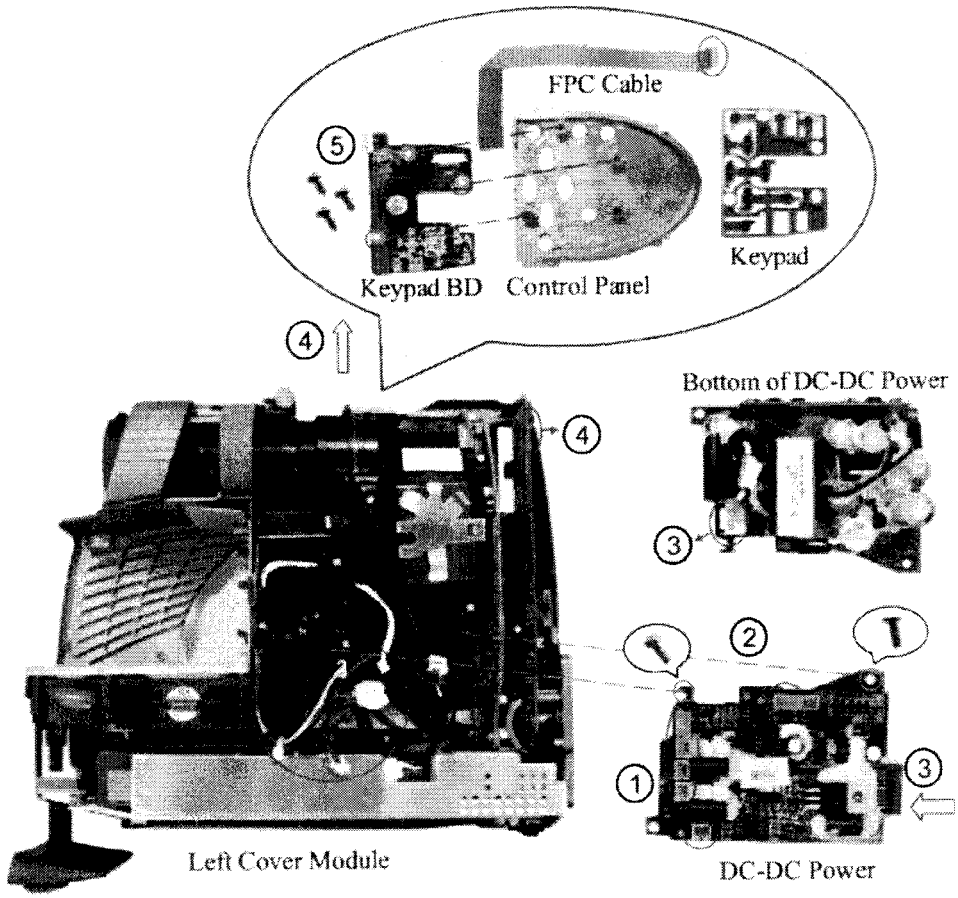
4-3 Disassembly of DC-DC Power and Control Panel Module



1. Unplug six cables on DC-DC Power.
2. Unscrew two screws(85.1A126.060 Pan Mech M2.6*6)(85.1A126.070 Pan Mech M2.6*7) on DC-DC Power.
3. Push and lift up DC-DC Power to unplug one cable on the bottom of DC-DC Power.
4. Unplug FPC cable from Main Board, and pull out Control Panel Module from Left Cover Module.
5. Unscrew three screws(85.WA126.050 Pan Tap M2.6*5) on Keypad Board.
6. Separate Keypad Board, FPC Cable, Keypad and Control Panel.

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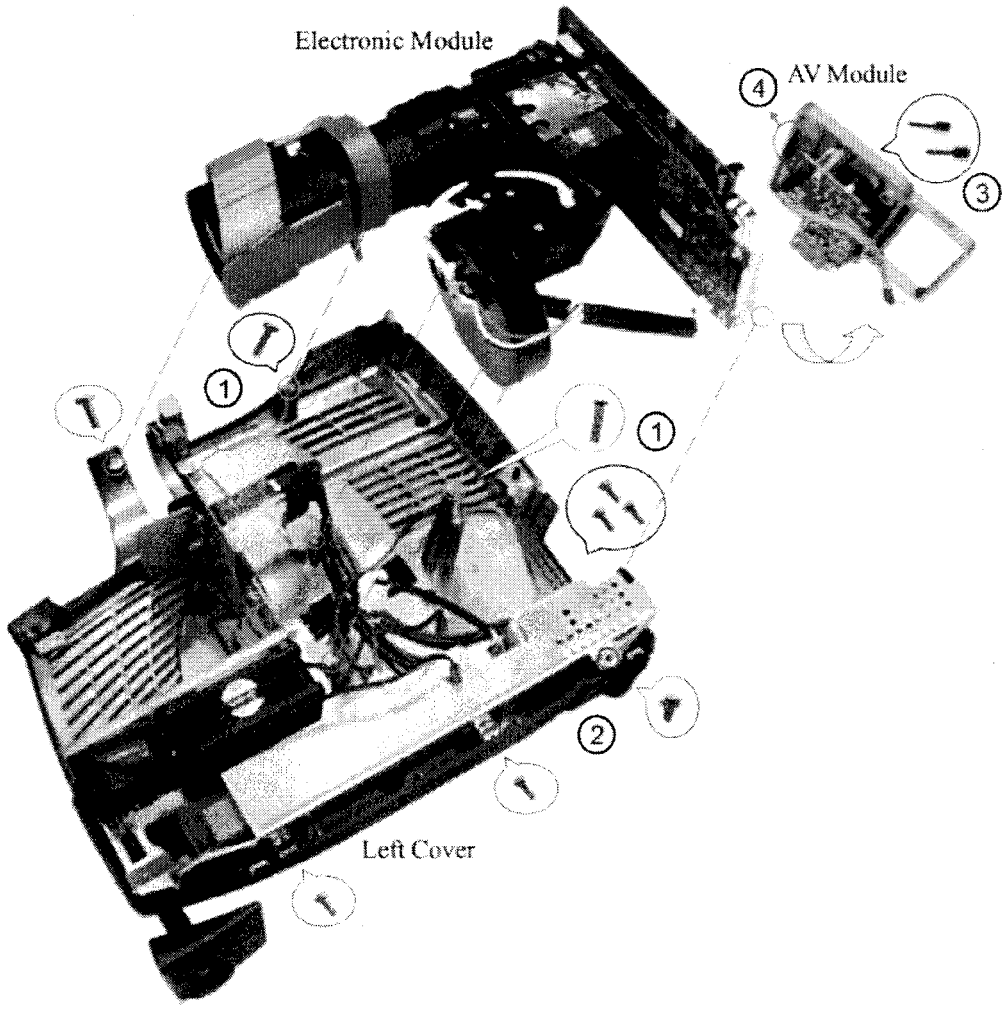
4-4 Disassembly of Electronic and AV Modules



1. Unscrew six screws(85.WA126.080 Pan Tap M2.6*8)(85.1A126.070 Pan Mech 2.6*7) (85.1A126.060 Pan Mech M2.6*6)(85.1A126.100 Pan Mech M2.6*10) on Left Cover.

2. Unscrew three screws(85.1C127.060 Pan Mech W/T M3.5*6)(85.1A126.060 Pan Mech M2.6*6) on Ballast Module to lift and take off Electronic and AV Module.

3. Unscrew two hex screws(61.00002.001 I/O 4-4ounc*H5*L7.5) on AV Module.

4. Disconnect the connector and separate Electronic and AV Modules.

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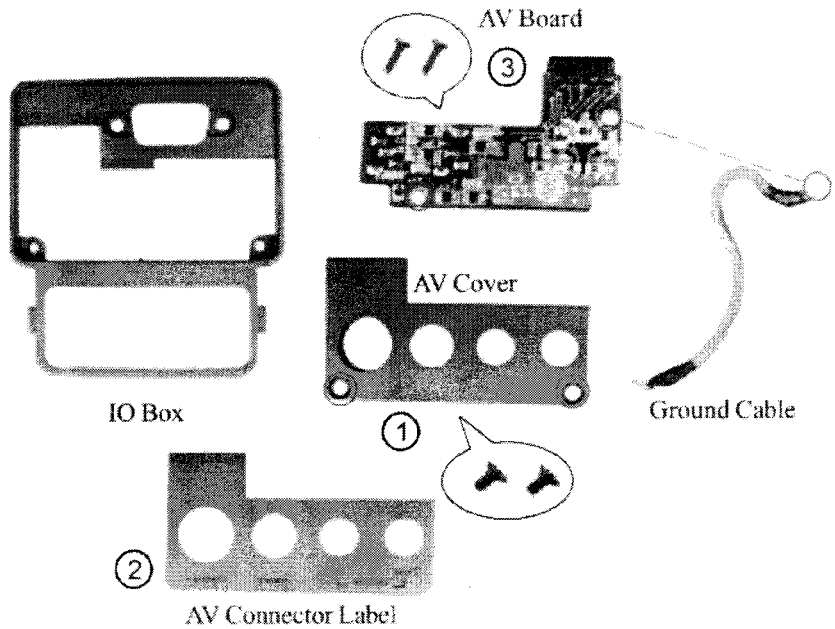
4-5 DISASSEMBLY OF AV MODULE



1. Unscrew two screws(85.WA126.080 Pan Tap M2.6*8) on AV Board to remove AV Board and Ground Cable.

2. Tear off AV Connect Label.

3. Unscrew two screws(85.YA323.060 Flat Tap M3*6) on AV Cover to remove IO Box.

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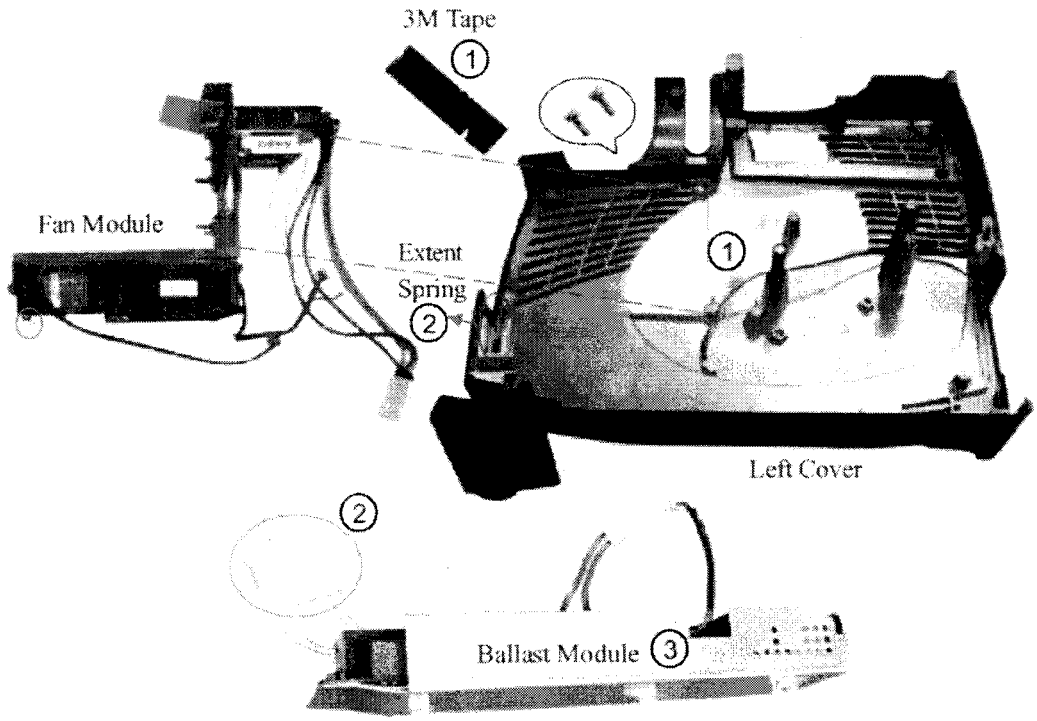
4-6 Disassembly of Ballast Module and Fan Module



1. Tear off 3M Tape(51.81540.001 17*60mm), and unscrew two screws (85.1A126.060 Pan Mech M2.6*6) on Left Cover to lift up Fan Module.

2. Separate Extent Spring and Fan Module, and pull out the connector to remove Fan Module.

3. Take off Ballast Module.

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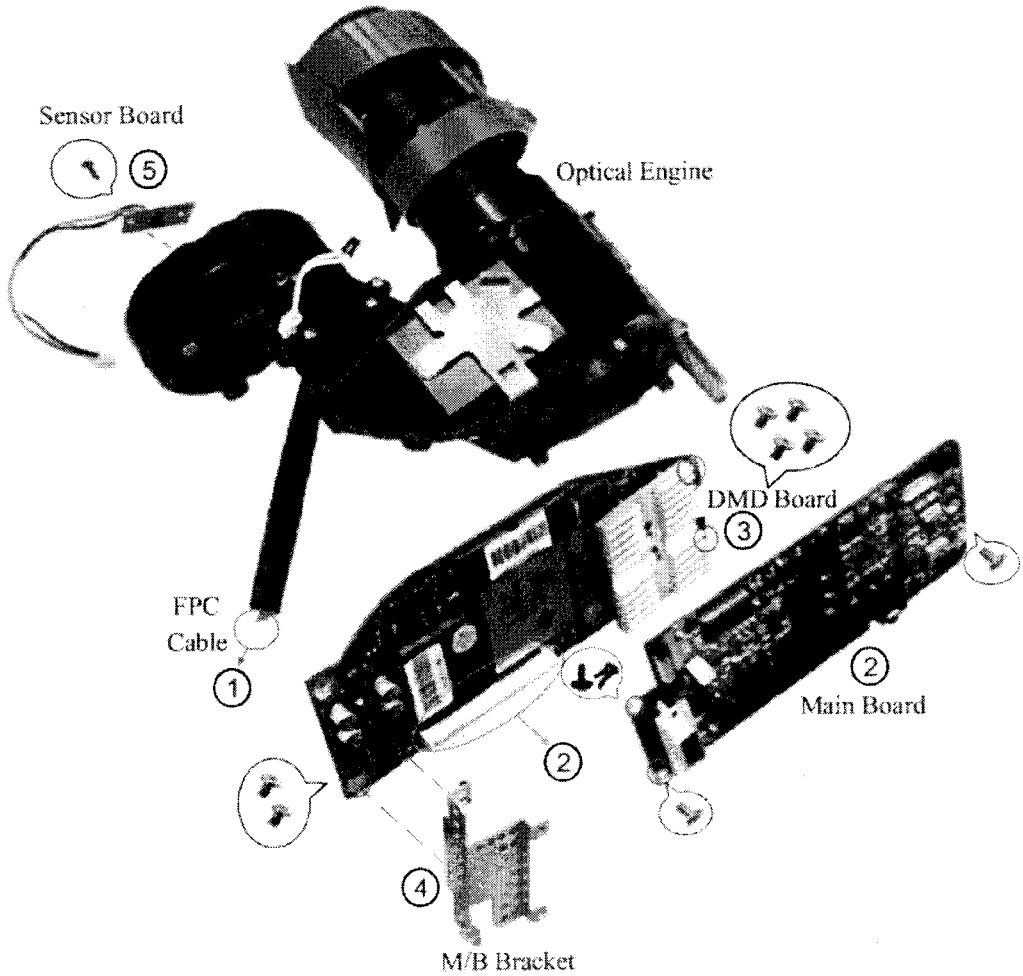
4-7 Disassembly of Engine, DMD Board and Main Board



1. Unplug FPC Cable from DMD Board.
2. Unscrew two screws(85.0A523.050 Pan Mech M3*5) and one nut(86.0A126.060 Nut Hex M2.6*0.45P) on Main Board and disconnect the connector to remove Main Board.
3. Unscrew four screws(85.0A523.050 Pan Mech M3*5) to remove DMD Board.
4. Unscrew two screws(85.0A523.050 Pan Mech M3*5) to take off Main Board Bracket.
5. Unscrew one screw(85.WA126.050 Pan Tap M2.6*5) to take off Sensor Board.

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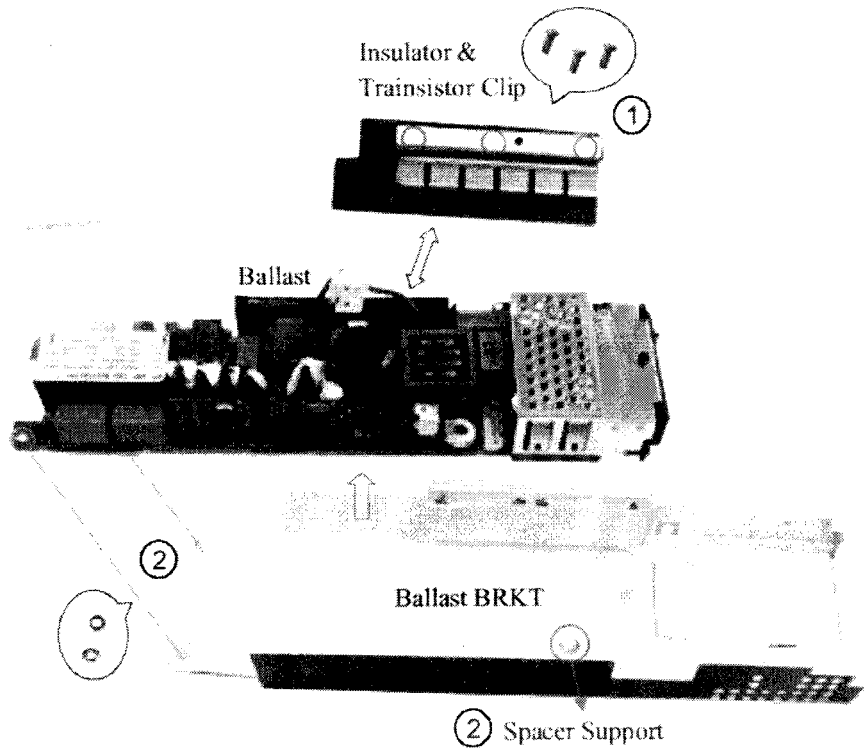
4-8 DISASSEMBLY OF BALLAST MODULE



1. Unscrew three screws(85.1A126.060 Pan Mech M2.6*6) on Insulator & Trainsistor Clip, take off Insulator & Transistor Clip from Ballast.

2. Unscrew two nuts(86.0A123.032 K Nut M3*0.5P) and a Spacer Support (51.81426.001) to separate Ballast from Ballast Bracket.

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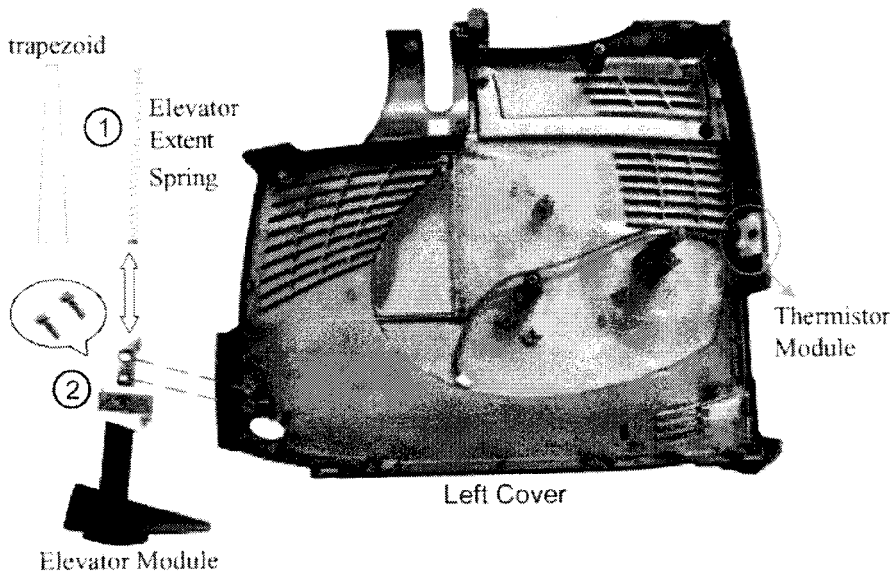
4-9 DISASSEMBLY OF ELEVATOR MODULE



1. Take off Elevator Extent Spring from Elevator Module.
   (Note : The spring is a trapezoid, and the wider side should be put into Elevator Module for assembling.)

2. Unscrew two screws(85.1A126.060 Pan Mech M2.6*6) to remove Elevator Module from Left Cover, then remove Thermistor Module.

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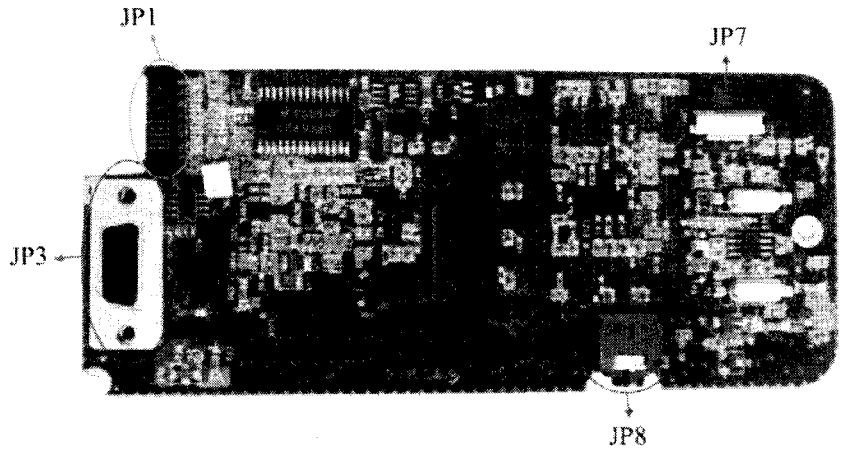
CHAPTER 5

FUNCTION OF BOARDS

This section provides each connector location on boards, signal and function of each board. They will be useful for your detecting the defective boards.

5-1 MAN BOARD (SIDE A)

5-1.1 The Location of Connector



5-1.2 JP7 : Keypad Connector

Pin#	*Signal Name*	*Function*
1	+3.3V	3.3V
2	IRDAT	IR Data
3	LED 1	LED Indication
4	LED 2	LED Indication
5	LED 3	LED Indication
6	LED 4	LED Indication
7	LED 5	LED Indication
8	LED 6	LED Indication
9	GND	Ground
10	Key 4	Keypad Control
11	Key 5	Keypad Control
12	Key 6	Keypad Control
13	GND	Ground
14	Key 7	Keypad Control
15	Key 8	Keypad Control
16	Key 9	Keypad Control

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5-1.3 JP1 : Digital Input Connector

Pin#	Signal Name	Function
1	AUD L	Audio L Input
2	AUD R	Audio R Input
3	AL EXT	Audio L Extension Out
4	AR EXT	Audio R Extension Out
5	AL EXTB	Audio L Extension Out
6	AR EXTB	Audio R Extension Out
7	GND	Ground
8	COMP	Composit Signal
9	CHROMA	Chrominance Signal
10	LUMA	Luminance Signal

5-1.4 JP3 : VGAIN Connector

Pin#	Signal Name	Function
1	VGAIN-R	Red Signal
2	VGAIN-G	Green Signal
3	VGAIN-B	Blue Signal
4	N.C.	No Connection
5	GND	Ground
6	GND	Ground
7	GND	Ground
8	GND	Ground
9	N.C.	No Connection
10	GND	Ground
11	N.C.	No Connection
12	SDA	DDC Data
13	VGAHIN	Horizontal SYNC
14	VGAVIN	Vertical SYNC
15	SCL	DDC Clock

5-1.5 JP8 : Upgrade Connector

Pin#	Signal Name	Function
1	TXD	Transmit Data
2	RXDB	Recieve Data
3	GND	Ground

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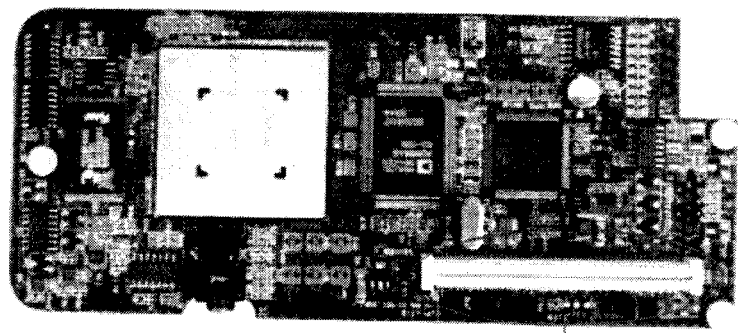
5-2 MAN BOARD (SIDE B)

5-2.1 The Location of Connector



5-2.2 JP6 : DMD Module Connector

Pin#	Signal Name	Function
1	GND	Ground
2	+5VAI	+5V
3	GND	Ground
4	+5VAI	+5V
5	GND	Ground
6	+3.3VI	+3.3V
7	GND	Ground
8	+3.3VI	+3.3V
9	GND	Ground
10	+3.3VI	+3.3V
11	GND	Ground
12	+3.3VI	+3.3V
13	GND	Ground
14	+3.3VI	+3.3V
15	GND	Ground
16	+3.3VI	+3.3V
17	GND	Ground
18	+3.3VI	+3.3V
19	N.C.	No Connection
20	N.C.	No Connection

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Pin#	Signal Name	Function
21	N.C.	No Connection
22	THERMOSTATB	Thermal Status
23	FANEN	Fan Enable
24	N.C.	No Connection
25	GND	Ground
26	-RESETO	Reset
27	PWRGOOD	Power Good
28	GND	Ground
29	TFIELD	Field Signal
30	CWINDEX	Color Wheel Index
31	VSYNCOZ	Vertical SYNC
32	GND	Ground
33	ACTDATA	Data Enable
34	GND	Ground
35	DCLKO	Pixel Clock
36	GND	Ground
37	BD1	Blue Data
38	GND	Ground
39	BD3	Blue Data
40	GND	Ground
41	BD5	Blue Data
42	GND	Ground
43	BD7	Blue Data
44	GND	Ground
45	RD1	Red Data
46	GND	Ground
47	RD3	Red Data
48	GND	Groumd
49	RD5	Red Data
50	GND	Ground
51	RD7	Red Data
52	GND	Ground
53	GD0	Green Data
54	GND	Ground
55	GD2	Green Data
56	GND	Ground
57	GD4	Green Data
58	GND	Ground
59	GD6	Green Data
60	GND	Ground

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Pin#	Signal Name	Function
61	+12VI	+12V
62	GND	Ground
63	+12VI	+12V
64	GND	Ground
65	+12VI	+12V
66	GND	Ground
67	+5VI	+5V
68	GND	Ground
69	+5VI	+5V
70	GND	Ground
71	+5VI	+5V
72	GND	Ground
73	N.C.	No Connection
74	N.C.	No Connection
75	N.C.	No Connection
76	N.C.	No Connection
77	N.C.	No Connection
78	SPOKE	No Connection
79	N.C.	No Connection
80	N.C.	No Connection
81	N.C.	No Connection
82	N.C.	No Connection
83	GND	Ground
84	SDA	Serial Data
85	SCL	Serial Clock
86	GND	Ground
87	LAMPSYNC	Lamp Enable
88	LAMPLIT	Lamp Lit
89	N.C.	No Connection
90	+3.3V	+3.3V
91	GND	Ground
92	HSYNCOZ	Horizontal SYNC
93	GND	Ground
94	OLACT	Main Channel (DPF2)
95	GND	Ground
96	BD0	Blue Data
97	GND	Ground
98	BD2	Blue Data
99	GND	Ground
100	BD4	Blue Data

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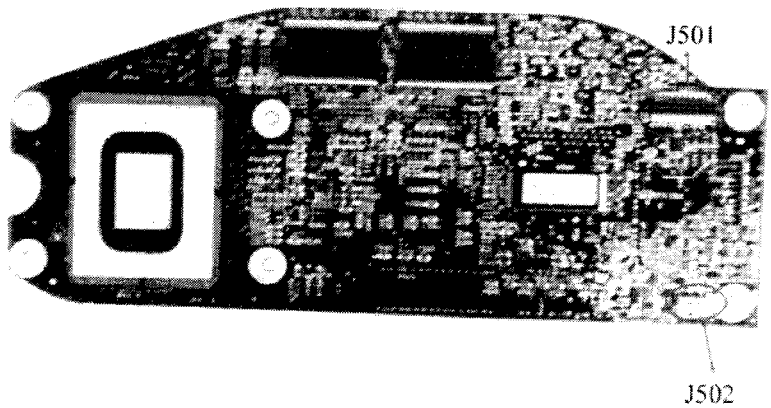
Pin#	Signal Name	Function
101	GND	Ground
102	BD6	Blue Data
103	GND	Ground
104	RD0	Red Data
105	GND	Ground
106	RD2	Red Data
107	GND	Ground
108	RD4	Red Data
109	GND	Ground
110	RD6	Red Data
111	GND	Ground
112	GND	Ground
113	GND	Ground
114	GD1	Green Data
115	GND	Ground
116	GD3	Green Data
117	GND	Ground
118	GD5	Green Data
119	GND	Ground
120	GD7	Green Data

5-3 DMD Board (Side A)

5-3.1 The Location of Connector



5-3.2 J502 : Color Wheel Connector

Pin#	Signal Name	Function
1	CW CTR	Color Wheel Motor Drive Signal
2	CW Y1	Color Wheel Motor Drive Signal
3	CW Y2	Color Wheel Motor Drive Signal
4	CW Y3	Color Wheel Motor Drive Signal

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5-3.3 J501 : DC-DC to DMD Formatter Board Connector

Pin#	Signal Name	Function
1	AVDD	+5V
2	A_GND	Ground
3	P12V	+12V
4	GND	Ground
5	VDD	+5V
6	GND	Ground
7	P3P3V	+3.3V
8	GND	Ground
9	AVDD	+5V
10	GND	Ground
11	P3P3V	+3.3V
12	GND	Ground
13	PWRGOOD	Power Good
14	J3_NC	No Connection
15	CWINDEX	Color Wheel Index
16	LAMPEN	Lamp Enable
17	FANEN	Fan Enable
18	LAMPLIT	Lamp Lit
19	PWRIO_SPARE	No Connection
20	THERMOSTAT	Thermal Status

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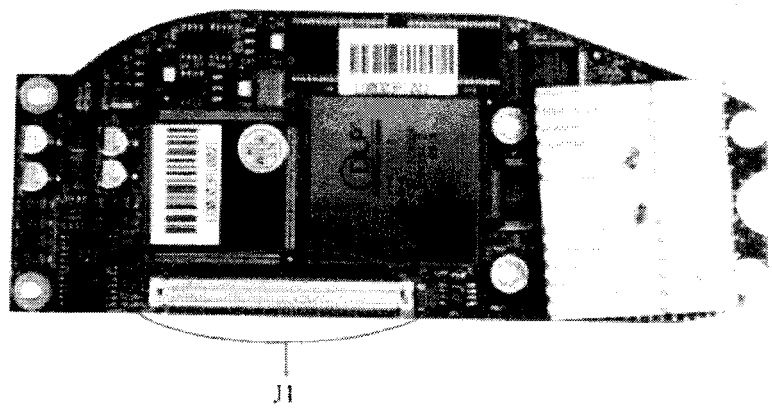
5-4 DMD Board (Side B)

5-4.1 The Location of Connector



5-4.2 J1 : DMD Module Connector

Pin#	*Signal Name*	*Function*
1	A_GND	Ground
2	AVDD	+5V
3	A_GND	Ground
4	AVDD	+5V
5	GND	Ground
6	P3P3V	+3.3V
7	GND	Ground
8	P3P3V	+3.3V
9	GND	Ground
10	P3P3V	+3.3V
11	GND	Ground
12	P3P3V	+3.3V
13	GND	Ground
14	P3P3V	+3.3V
15	GND	Ground
16	P3P3V	+3.3V
17	GND	Ground
18	P3P3V	+3.3V
19	CCLK	Clock to DPF2A
20	XPROGEN	DPF2A Program Enable

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Pin#	Signal Name	Function
21	SEQDATAO	Sequence PROM Data
22	THERMOSTAT	Thermal Status
23	FANEN	Fan Enable
24	PWRIO_SPARE	Power Signal
25	GND	Ground
26	RESETZ	Reset
27	PWRGOOD	Power Good
28	GND	Ground
29	TFIELD	Field Signal
30	CWINDEX	Color Wheel Index
31	VSYNCZ	Vertical SYNC
32	GND	Ground
33	ACTDATA	Data Enable
34	GND	Ground
35	CLKIN	Pixel Clock
36	GND	Ground
37	BU1	Blue Data
38	GND	Ground
39	BU3	Blue Data
40	GND	Ground
41	BU5	Blue Data
42	GND	Ground
43	BU7	Blue Data
44	GND	Ground
45	RV1	Red Data
46	GND	Ground
47	RV3	Red Data
48	GND	Ground
49	RV5	Red Data
50	GND	Ground
51	RV7	Red Data
52	GND	Ground
53	GY1	Green Data
54	GND	Ground
55	GY3	Green Data
56	GND	Ground
57	GY5	Green Data
58	GND	Ground
59	GY7	Green Data
60	GND	Ground

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Pin#	Signal Name	Function
61	P12V	+12V
62	GND	Ground
63	P12V	+12V
64	GND	Ground
65	P12V	+12V
66	GND	Ground
67	VDD	+5V
68	GND	Ground
69	VDD	+5V
70	GND	Ground
71	VDD	+5V
72	GND	Ground
73	FL_MODE	Micro Controller Mode
74	FL_VPP	Micro Controller VPP.
75	FL_RXD	Receive Data(cw)
76	FL_TXD	Transmit Data (cw)
77	FL_RSTZ	Reset
78	SPOKE/TP1	FPGA Status
79	FPGATP0	FPGA Status
80	FPGATP2	FPGA Status
81	CONN_SPARE1	No Connection
82	VBIAS	Reset ASIC Bias
83	GND	Ground
84	SDA	Serial Data
85	SCL	Serial Clock
86	GND	Ground
87	LAMPSYNC	Lamp Sync
88	LAMPLIT	Lamp Lit
89	LAMPEN	Lamp Enable
90	SYNCVALID	Data Control (FPGA)
91	GND	Ground
92	HSYNCZ	Horizontal SYNC
93	GND	Ground
94	DLACT	Main Channel (DPF2)
95	GND	Ground
96	BU0	Blue Data
97	GND	Ground
98	BU2	Blue Data
99	GND	Ground
100	BU4	Blue Data

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Pin#	Signal Name	Function
101	GND	Ground
102	BU6	Blue Data
103	GND	Ground
104	RV0	Red Data
105	GND	Ground
106	RV2	Red Data
107	GND	Ground
108	RV4	Red Data
109	GND	Ground
110	RV6	Red Data
111	GND	Ground
112	GY0	Ground
113	GND	Ground
114	GY2	Green Data
115	GND	Ground
116	GY4	Green Data
117	GND	Ground
118	GY6	Green Data
119	GND	Ground
120	GY8	Green Data

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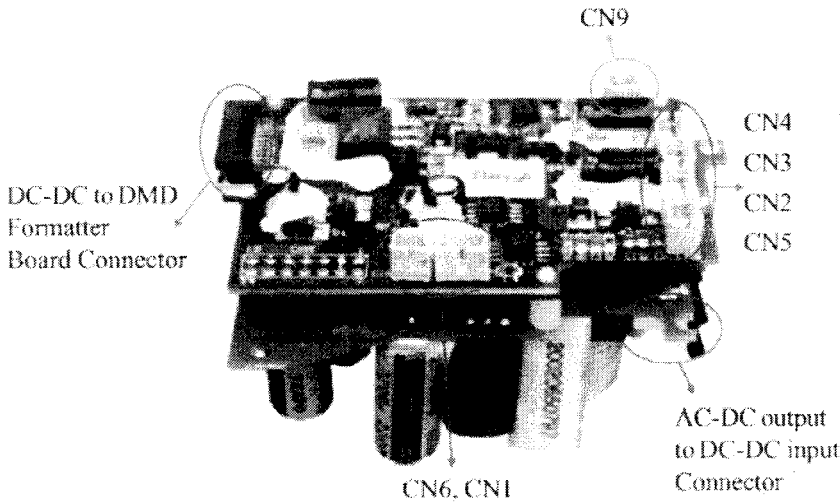
5-5 DC-DC CONVERTER

5-5.1 The Location of Connector



5-5.2 DC-DC to DMD Formatter Board Connector

Pin#	*Signal Name*	*Function*
1	+5V, analog	+5V
2	GND2 (5V analog)	Ground
3	+12V	+12V
4	GND	Ground
5	+5V, Digital	+5V
6	GND	Ground
7	+3.3V	+3.3V
8	GND	Ground
9	+3.3V	+3.3V
10	GND	Ground
11	+3.3V	+3.3V
12	GND	Ground
13	Power Good	Power Good
14	Spare	No Connection
15	CWINDEX	Color Wheel Index
16	Lamp Enable/Sync	Lamp Enable
17	Fan Enable	Fan Enable
18	Lamp Lit	Lamp Lit
19	PWRIO Spare	No Connection
20	THERMOSTAT	Thermal Status

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5-5.3 CN4 : Fan Connector

Pin#	Signal Name	Function
1	+12V, Fan	+12V
2	GND	Ground

5-5.4 CN3 : Fan Connector

Pin#	Signal Name	Function
1	+12V, Fan	+12V
2	GND	Ground

5-5.5 CN2 : Thermal Connector

Pin#	Signal Name	Function
1	Thermostat Pinl	Thermal Status
2	Thermostat Pin2 (GND)	Ground

5-5.6 CN5 : Sensor Connector

Pin#	Signal Name	Function
1	+5V, Logic	+5V
2	GND	Ground
3	Data	Data

5-5.7 CN6 : Fan Connector

Pin#	Signal Name	Function
1	+5V, Fan	+5V
2	GND	Ground

5-5.8 CN1 : Lamp Power Connector

Pin#	Signal Name	Function
1	Enable/Sync	Enable
2	GND	Ground
3	Lamp Lit	Lamp Lit

5-5.9 AC-DC output to DC-DC input Connector

Pin#	Signal Name	Function
1	+400VDC	+400VDC
2	RTN	Return

5-5.10 CN9 : Thermistor Connector

Pin#	Signal Name	Function
1	Thermistor Pin1	Thermal Status
2	Thermistor Pin2	Ground

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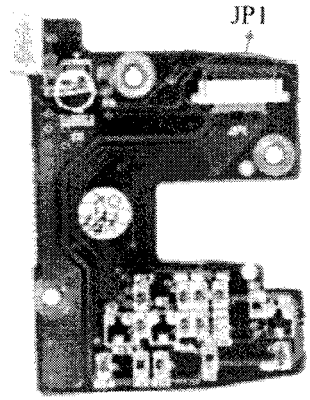
5-6 KEYPAD BOARD

5-6.1 The Location of Connector



5-6.2 JP1 : Keypad Connector

Pin#	Signal Name	Function
1	+3.3V	3.3V
2	IRDAT	IR Data
3	LED 1	LED Indication
4	LED 2	LED Indication
5	LED 3	LED Indication
6	LED 4	LED Indication
7	LED 5	LED Indication
8	LED 6	LED Indication
9	GND	Ground
10	Key 4	Keypad Control
11	Key 5	Keypad Control
12	Key 6	Keypad Control
13	GND	Ground
14	Key 7	Keypad Control
15	Key 8	Keypad Control
16	Key 9	Keypad Control

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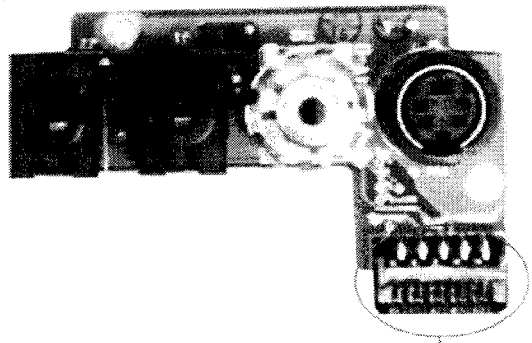
5-7 AV BOARD

5-7.1 The Location of Connector



5-7.2 JP1 : Digital Input Connector

Pin#	Signal Name	Function
1	AUD L	Audio L Input
2	AUD R	Audio R Input
3	AL EXT	Audio L Extension Out
4	AR EXT	Audio R Extension Out
5	AL EXTB	Audio L Extension Out
6	AR EXTB	Audio R Extension Out
7	GND	Ground
8	COMP	Composit Signal
9	CHROMA	Chrominance Signal
10	LUMA	Luminance Signal

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CHAPTER 6

TROUBLESHOOTING PROCEDURE

This chapter provides technicians and people who have an electronic background a primary description about maintaining the product. Moreover, you can get the appropriate operation to solve some complicated problems of component repairing and professional problems.

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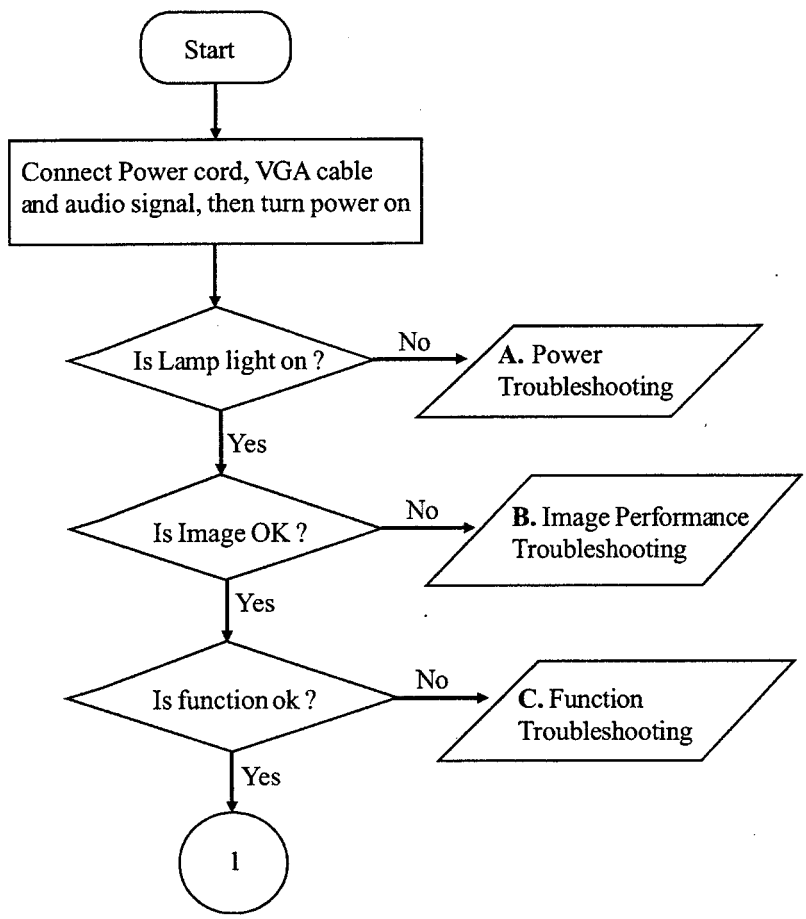
6-1 EQUIPMENT NEEDED

- PJ875
- VGA Cable, Power Cord
- PC (Personal Computer)
- Audio Input, Video Input
- Screw Drivers

6-2 MAIN PROCEDURE



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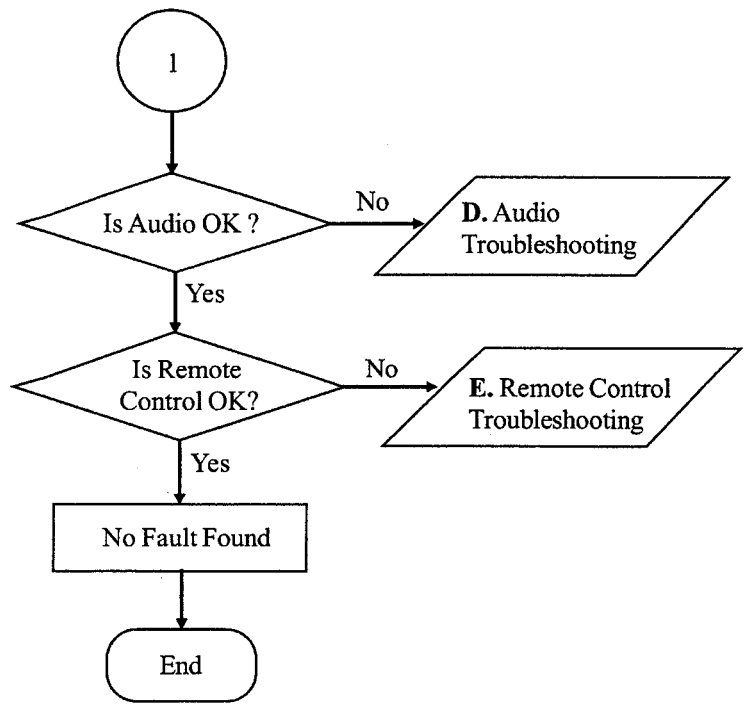

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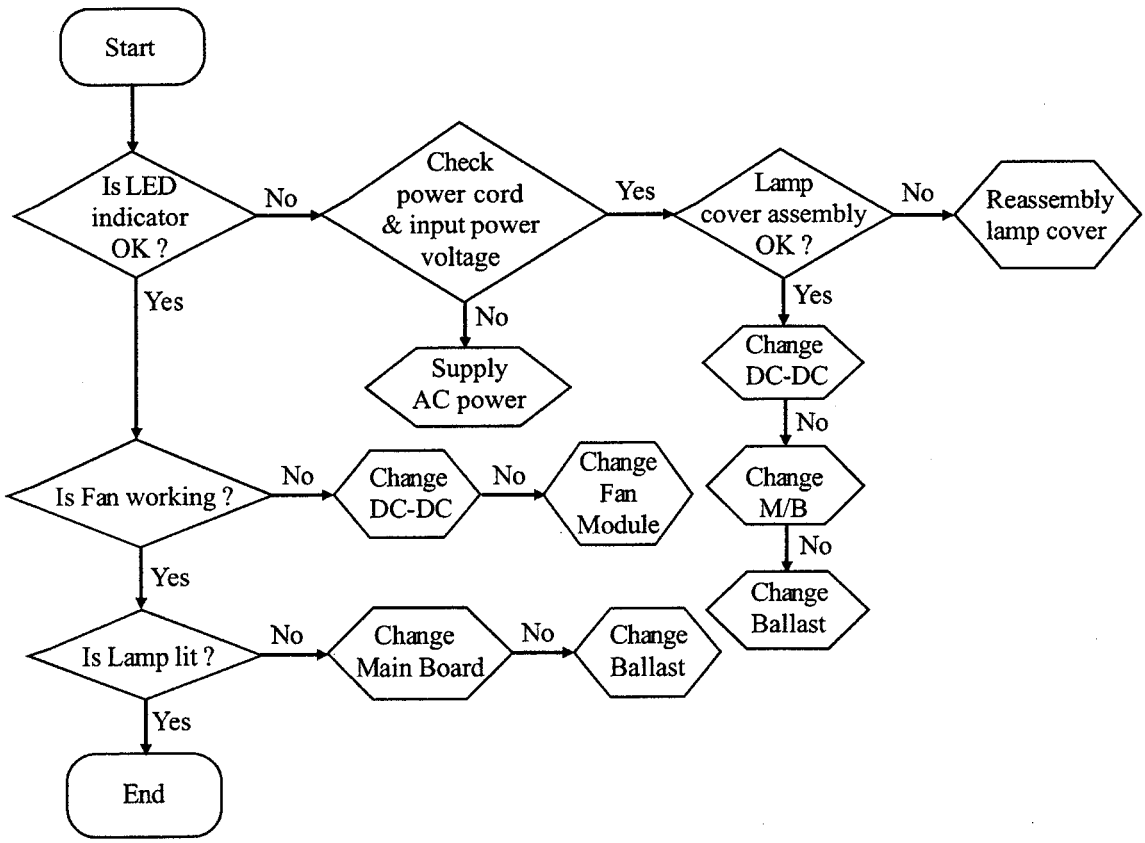
6-2.1 A. Power Troubleshooting



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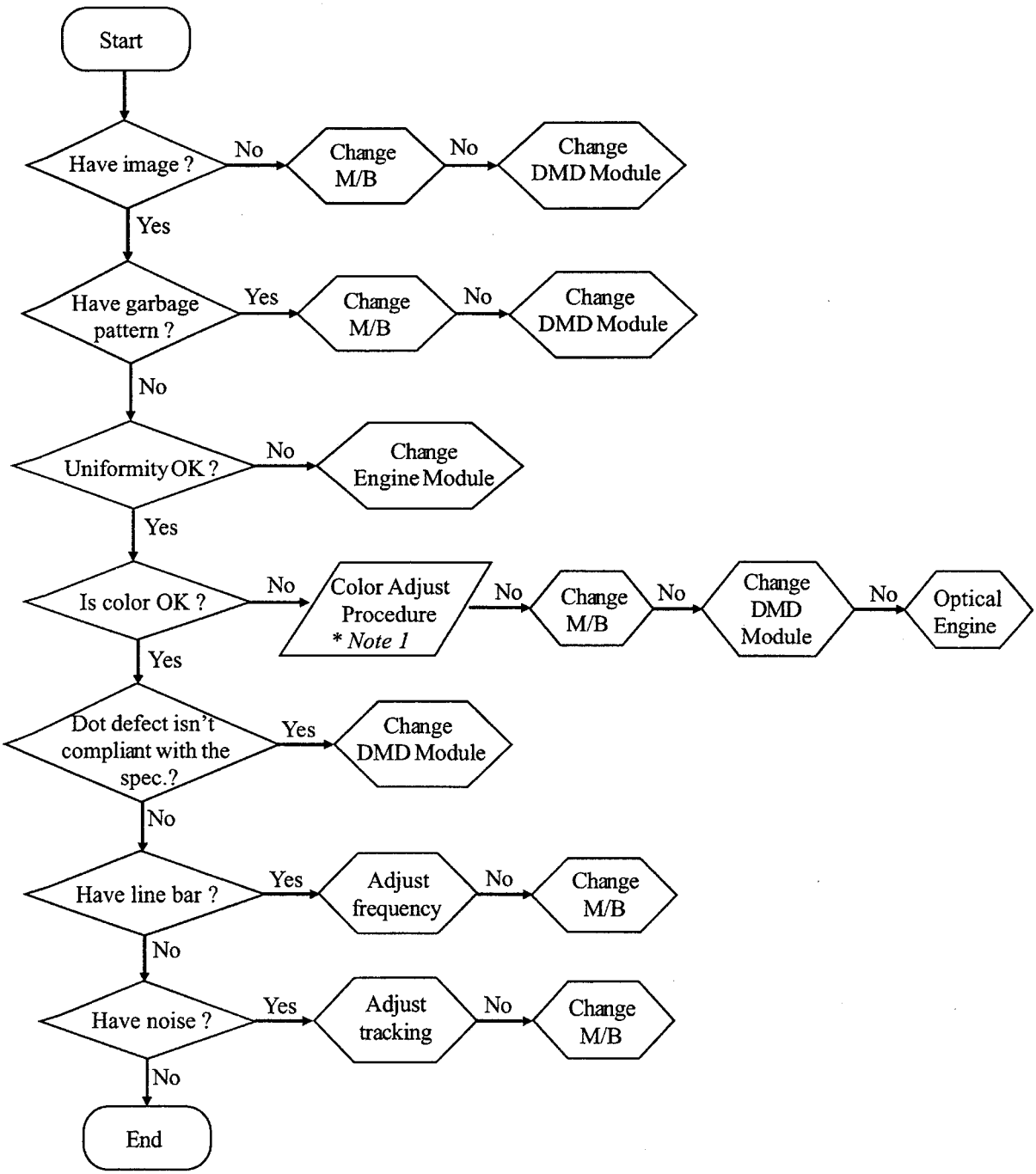
6-2.2 B. Performance Troubleshooting



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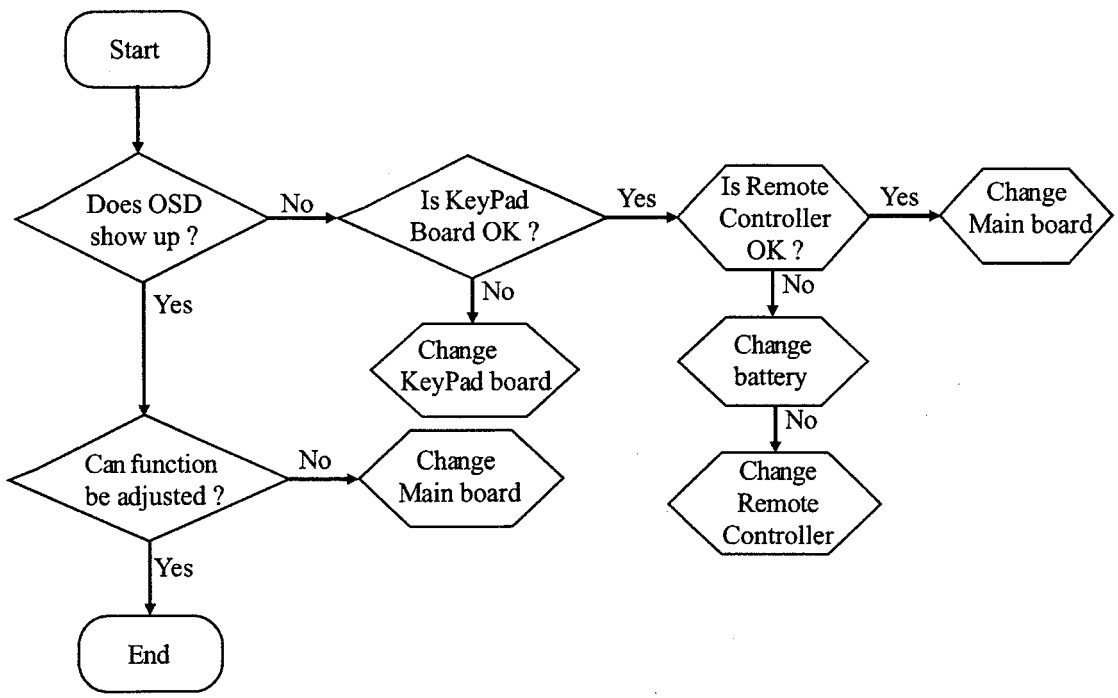
Color Adjust Procedure :

Notice : PC shall run R.G.B. gray scale pattern (3:169 pattern) of DMU Program.

1. Press menu button and power on simultaneously. Hold menu button until ViewSonic logo shows on the screen.
2. Press menu button again and OSD will appear on the screen.
3. Choose service function.
4. Choose "displaying hours" function.
5. Press "-", "+" and "-" buttons in turn.
6. Press "+" or "-" button to adjust.

✎ *Note 1 : It may need to be used when you replace Main Board or Optical Engine alone.*

6-2.3 C. Function Troubleshooting



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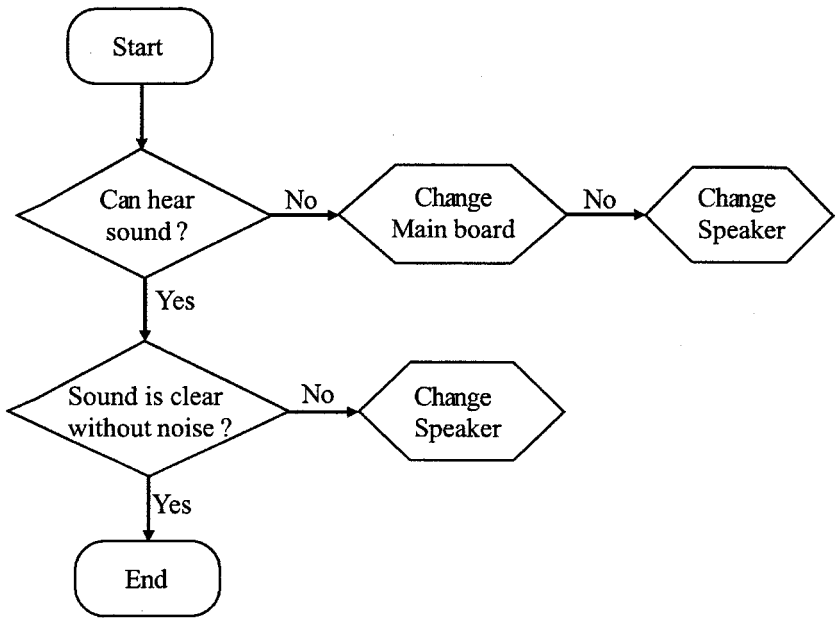
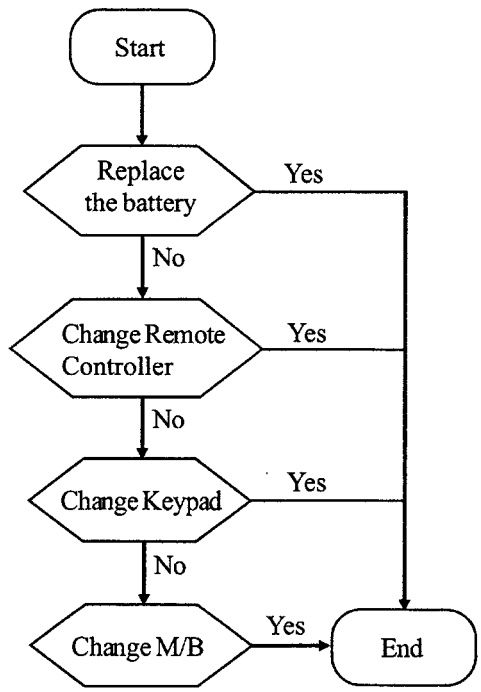
6-2.4 D. Audio Troubleshooting



6-2.5 E. Remote Control Troubleshooting



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CHAPTER 7

SPECIFICATIONS

This chapter provides DMD, Lamp and DC-DC Power specifications. All specifications are for your reference.

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7-1 DC-DC Power Specification

7-1.1 DC-DC Power Requirements

Description	Requirement	Comment
General :		
Efficiency, Overall, Min.	85%	Input voltage is 392Vdc with max. load
Load, Nominal	90% of Max.	For each individual DC output voltage
Load Variation, Max.	10%	DC-DC output voltage shall meet all requirements while the load is within measured from 90% (expected typical) of max. load.
Output Voltage Variation, No Load Operation	6%	The DC output voltage shall not exceed this tolerance under no load conditions. No part of the IPS subsystem shall be damaged. Nor shall over voltage protection circuitry activate, as a result of no load operation.
Start Cycle Time, Max.	0.5 Seconds	All operation voltage available.
Start Sequencing	No order	All voltages shall monotonically arrive within specification limits, and remain.
Start Period, All Voltages	50 milliseconds	All voltages, first to last, shall monotonically arrive within specification limits, and remain within specification limits. Within this period.
Input :		
Input Requirements	400Vdc ± 8Vdc	Output of AC-DC converter (PFC)
Output :		
Standby Output Power	None	No DC output standby power voltage is required, expected fan voltage.
Over Voltage Protection, Limit Points	Refer to 7-1.2	Over voltage protection limits may exceed the recommended operating limits of the projector electronics and may affect reliability of those electronics if applied for an extended period of time. Additionally, the over voltage protection electronics shall utilize circuitry that will fail in the short circuit, rather than open circuit mode.

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Description	Requirement	Comment
Power God		Circuitry detects key parameters(such as AC line conditions, DC voltages, ...) to determine stable operation and provides command to projector electronics enabling normal operation. When power good goes false, the projector electronics will initiate orderly shut-down of key circuitry.
Mechanical :		
Weight, Max.	100 Grams	
Size, Outline	Width : 50mm Length : 65mm Height : 50mm	
Size, Volume, Max.	162.5cm^3	
Housing	None	All requirements shall be met without a separate power supply housing.

7-1.2 Over Voltage Protection, Limit Points

Description	Limit Point	Units
Voltage, 3.3Vout	4.0	Volts DC
Voltage, 5.0Vout, Analog	6.0	Volts DC
Voltage, 5.125Vout, Logic	6.0	Volts DC
Voltage, 12.0Vout	14.0	Volts DC

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7-1.3 Output Votage, Current and Ripple Requirement

Description	Min.	Nom.	Max.	Units	Comment
System Board					
Voltage, 3.3Vout	3.14	3.3	3.46	Volts DC	
Current, 3.3Vout	-	1.7	2.0	Amps	(Preliminary value)
Ripple, 3.3Vout	-	-	50	Millivolt, pk-pk	Measured with <20 MHz Bandwidth
Voltage, 5.0Vout, Analog	5.0	5.125	5.25	Volts DC	
Current, 5.0Vout, Analog	-	-	0.2	Amps	(Preliminary value)
Ripple, 5.0Vout, Analog	-	-	50	Millivolt, pk-pk	Measured with <20 MHz Bandwidth.
Voltage, 5.0Vout, Logic	5.0	5.125	5.25	Volts DC	For low noise circuit.
Current, 5.0Vout, Logic	-	0.6	1.0	Amps	(Preliminary value)
Ripple, 5.0Vout, Logic	-	-	50	Millivolt, pk-pk	Measured with <20 MHz Bandwidth.
Voltage, 12.0Vout	11.4	12.0	12.6	Volts DC	
Current, 12.0Vout	-	0.6	1.5	Amps	(Preliminary value)
Ripple, 12.0Vout	-	-	100	Millivolt, pk-pk	Measured with <20 MHz Bandwidth.
Surge Current, 12.0Vout		2.0		Amps	For 4 seconds at start up.

Note :

1. *When the standby signal goes to logic high, the fan voltage is 9.8V min. which the room temperature is 25°C or 11.5V - 12.5V which the room temperature is greater than 31°C - 33°C.*
2. *When the standby signal goes to logic low, the fan voltage is 7.5V - 8.5V.*

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7-1.4 Environmental Requirement

Operating Mode	Specifications	Remarks
Temperature		
Operating :	0°C to 45°C	For ambient environment.
Storage (Non-operating) :	-30°C to 65°C	For ambient environment.
Humidity		
Operating :	5% to 95% Relative humidity, Non-condensing	Ambient environment.
Storage (Non-operating) :	5% to 95% Relative humidity, Non-condensing	Ambient environment.
Altitude		
Operating :	Zero to 12,000 feet above sea level	Ambient environment. Design shall include heat load of [TBD] to simulate installation in system.
Storage/Transportation (Non-operating) :	Zero to 40,000 feet above sea level	Ambient environment.

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7-2 DMD SPECIFICATION

Table 1. Physical and Optical Performance Parameters

PARAMETER	MIN	NOM	MAX	UNIT	REMARK
Total height (mirror array)		10.20		mm	
Total width (mirror array)		14.42		mm	
Pixel pitch		17		um	
Differential (device to device) in mirror position relative to mirror position (0,0)			1	um	Note 1
Mirror tilt (half angle)	9	10	11	degrees	Note 2
Axis of rotation (upper right to lower left, relative to array major axes)	44.0	45	46.0	degrees	
Mirror transition time			10	us	Note 3
Flatness gradient over total mirror array			0.1	%	Note 4
Active area specular reflectivity	60	63		%	
Contrast ratio	225:1	250:1		ratio	Note 5
Non-functional n" mirrors				mirrors	Note 6
Non-functional flat or ff" mirrors				mirrors	Note 6
Blemish intensity differential within active area (excluding non-functional mirrors)				N/A	Note 7
Parallelism of active area to system interface plane			0.25	mm	Note 8
Rotational angle between active area and package datum			0.8	degrees	Note 8
Combined tilt of active area relative to system interface plane			0.25	degrees	Note 8
Window thickness	2.87	3.00	3.13	mm	Note 9
Window refractive index	1.477	1.487	1.497		Note 9
Window transmissivity (including AR coating, mearsure @420-700 nanometers)	98			%	Note 9
Window flatness (@550 nanometers) - spherical power/irregularity (astigmatism, etc.)			4/2	fringes	Note 9
Window surface quality (inside only)				N/A	Note 9
Opaque particle diameter (inside window surface only)				N/A	Note 7, 9

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PARAMETER	MIN	NOM	MAX	UNIT	REMARK
Distance between apertured window and active area			0.76	mm	Note 7, 9
Window aperture total reflectivity Reflective type Absorptivetype	 90 7			 % %	Note 10, 11
Active area absorption coefficient		33	35	%	Note 11
Thermal impedance, active area to case			0.7	°C/W	Note 11
Thermal impedence, window aperture to case			6.0	°C/W	Note 10, 11
Thermal impedance, case to thermal stud			0.8	°C/W	Note 11
Electrical input power			0.95	w	Note 11

Note 1 : Differential Mirror Position

Differential mirror position refers to the geometric distortion of the array compared to an ideal array that locates the center of each mirror on the corresponding grid at 17.0 micron pitch. It is created by distortion in the optical performance of the semiconductor processing equipment used to define the array, and to a lesser extent by warpage and nonuniform etching in processing of the array. As an example, for the 8460 device, which has a resolution of 848 horizontal by 600 vertical pixels, if we define a coordinate system with origin at the upper left corner pixel (0,0), the pixel at the lower right hand corner will be at coordinates (14,399 +/- 1 micron, 10,183 +/- 1 micron). Similar tolerances apply within the array, e.g., the pixel in the 100th row and 100th column will be centered at coordinates (1700 +/- 1 micron, 1700 +/- 1 micron) assuming we define the corner pixel as being in the zeroth row and the zeroth column, centered at coordinates (0,0).

Note 2 : Tilt Angle Tolerance

Limits on variability of mirror tilt half angle are critical in the design of the accompanying optical system. Variations in tilt angle within a device may result in aparent non-uniformities, such as line pairing and image mottling, across the projected image. Variations in the average tilt angle between devices may result in colorimetry problems and a reduction in system contrast. The specified limits represent the tolerances of the average tilt angle between devices. Tilt angle variation within a device is discussed in Note 7.

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Note 3 : Mirror Transition Time

The time it takes for a mirror to make an opposite side transition (i.e., off to on, or on to off) impacts the optical efficiency of the total system. Bit resolution, bit splitting, maximum optical output, and contrast ratio are all impacted by the flight time of the mirror during reset. The specified level is intended to measure the dynamics of the superstructure independent of load or cycle time. It is computed by measuring the optical output during a transition from the off state to the on state beginning with the initiation of reset and concluding when the light output first reaches 80% of the output of the on state. Mirror dynamics require that address data not be changed for a settling time following the mirror transition time.

Note 4 : Active Area Reflectivity

The DMD specular reflectivity is defined as the ratio of the light incident upon the mirror array to the light specularly reflected from it. The measurement is made with all mirrors in the full on state without electronic duty cycle effects (i.e. measure using 100% duty cycle). The specified specular reflectivity applies to any arbitrary point on the DMD active area. See Table 2 for the applicable illumination conditions.

Note 5 : Contrast Ratio

The DMD contrast is defined as the ratio of the light reflected from the DMD in the full on state to the light reflected in the full off state. See Table 1 for the applicable illumination conditions. Note that the dynamic reflection conditions caused by mirror switching will degrade the effective contrast of the DMD in projector systems.

Note 6 : Non-Functional Mirrors

Mirrors which cannot be controlled electronically result in saturated light (stuck on), saturated dark (stuck off) or non-saturated (stuck flat) pixels during normal operation. depending on use conditions and final system requirements, a limited number of pixel defects may be tolerable within the warranty period. The required state (light, dark, or non-saturated), restrictions on location within the array, and maximum count of non-functional mirrors are defined only for particular systems, and may be found in the applicable image quality specification. The non-functional mirror defect growth rate shall not exceed 1 per year. The degree of saturation of non-saturated non-functional mirror defects depend both on the particular defect and the system configuration.

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Note 7 : Blemishes

Non-uniformities in the mirror array or optical window may result in localized variations in the luminous output (i.e., blemishes) across the surface of the device when viewed in an optical imaging environment. Such localized non-uniformities may result from a varity of sources, including variations in tilt angles, mirror cupping, foreign particles on the array or inside window surface, window scratches, etc. The magnitude of the projected non-uniformities is highly system dependent. Practicaly speaking, blemishes arising from window defects will be of a common size which depends critically on the system optics. The effect of defect size is generally limited to the differential brightness associated with the defect for scratch, dig and particle defects of practical size. Restrictions on location within the array, maximum count, and differential brightness are defined only for particular systems, and may be found in the applicable product image quality specification.

Note 8 : Placement of Active Area within Package

The positioning of the die active area within the hermetic package is delineated in Figure 6, Figure 7, and Figure 9. Practical optical systems will need to comprehend a maximum of 0.003" variability in the focal plane of the modulating element referenced to the datum [A], Figure 7 in the absence of any alignment mechanism in the system. if some means of rotational alignment with respect to the system optical axis is comprehended by the design, this variability falls to 0.0014" per Figure 7, datum [K]. The in-plane rotational angle between active area and package datum, Figure 9, note 3 is 0.0 +/- 0.8 degrees. The true position tolerance relative to the package datum is 0.5mm.

Note 9 : Window Optical Properties

The optical quality of the window is an important contributor to the quality of the projected image. To meet the uniformity requirements discussed previously, the minimum window opening defined in Figure 9 must be free of striae, bubbles, inclusions, birefringence, and particles which might degrade the optical performance of the packaged DMD. Visibility of scratch, dig, and particle defects are highly system dependent. The window opening must not block any dump light from the active area. To maximize contrast, the window is coated on both sides by an anti-reflective coating. The average reflectance shall be less than 0.5% for wavelengths of 420-700 nanometers and any angle between normal and 30 degrees. The index of refrection is specified for a light wavelength of 545 nanometers.

Note 10 : Window Aperture

A shield is utilized on the interior perimeter of the window to improve system contrast and reduce the thermal loading caused from the overfill of incident light. The shield may be of either reflective or absorptive type. Incident light of up to f/2.8 (input cone angle of 20° ± 10°) shall be supported without interference (active area shading) from the window aperture. The window aperture is designed to accept light at an incidence angle of ≤ 52° within the perimeter of the window. Light that falls outside the window clear aperture or outside the specified angle will have detrimental effect on system optical and thermal performance. The window aperture is depicted in Figure 7, Figure 9, and Figure 10. The packaged assembly shall accommodate incident light from the direction shown in Figure 9 and Figure 10. Section Z-Z in Figure 10 illustrates the angles and direction of the projected and dump light with incident light from the indicated direction. The edges of the package reflective shield aperture near the DMD active area shall not cause scattering of the incident or dump light to be objectionable in the projected image area. Specular reflectivity is defined for the illumination conditions in Table 2.

Note 11 : Thermal Performance

The DMD is designed to conduct residual heat energy to the back of the package where it can be removed by an appropriate heat sink. A device configured for a particular application can be manufactures with a thermal stud designated for that appication (see Appendix A-). The thermal stud mounting location is shown in Figure 8. The heat sink and cooling system must be capable of maintaining the package within the specified operational temperatures. The total heat load is largely driven by the incident light absorbed by the active area although other significant contributions that should be considered include light energy absorbed by the window aperture and electrical input power. The portion of incident light absorbed by the active area is determined from the active area absorption coefficient in Table 1. The absorption by the window aperture is the light neither specularly nor diffusely reflected according to the window aperture reflectvity parameters shown in Table 1. Optical systems should be designed so that no significant light energy falls outside the window clear aperture as shown in Figure 9, as any significant additional thermal load on the case top can damage the device.

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Table 2. Standard DMD Illumination Conditions

PARAMETER	INPUT CONDITION	OUTPUT CONDITION	NOTES
Beam numerical aperture (NA)	0.167 (f/3.0)	0.167 (f/3.0)	NA = n SIN U n = 1 (air) U = 9.6°
Beam chief ray angle off perpendicular	20° ± 0.25°	0° ± 0.25°	Relative to system interface plane
Chef ray clocking from active area center lines	45° ± 1°		Perpendicular to mirror tilt axis
Spectral blue edge red edge	 420 ± 20nm 700 ± 20nm	 420 ± 20nm 700 ± 20nm	10% intensity points of filters

DMD Panel Screen

a. Bright, Color, Dark (all pattern) : (1 dot = 1 pixel)

Bright dot	not allowed
Dark dot	≤ 3
Adjacent dark dots	not allowed
Unstable, blemish dots	≤ 6

b. Blue 180 pattern :

Dark blemish dots	not allowed

c. Gray 30 pattern :

Bright blemish dots	not allowed

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7-3 LAMP AND LAMP DRIVER SPECIFICATION

- ***Lamp Driver Data***

Input Voltage, nominal	110V to 240V AC, 50/60Hz
Input Current, nominal	2.0A to 0.8A
Input Wattage, nominal	200W
Power Dissipation	30W max.
Output Voltage 1 (Lamp)	85V AC rectangular
Output Current 1	1.8A
Output Voltage 2 (DC-DC)	400V
Output Current 2	0.08A
Ignition Pulse	2*10kVp for max. 4s
Cooling Method	Forced air cooling at 1 m/s minimum

- ***Operating and Measurement Conditions***

Ballast Type	Test conditions stable at 150W with OSRAM PT VIP 150 AC/100-240 C LOFS ballast
Rated Lamp Wattage	150W
Burner Position	0°C to +20°C (0° optical axis horizontal)
Burning Position	Horizontal

- ***Typical Burner Characteristics (initial)***

UV-Output	UVA	(315 - 400nm) 8.75W typical
	UVB	(280 - 315nm) < 0.13W
	UVC	(248 - 280nm) < 0.01W
UV-output through reflector		(248 - 400nm) 2.6W typical
Total Visible Flux		(400 - 780nm) 37.5W nom
IR		(780 - 2500nm) 37.5W typical

- ***Average Lamp Life and Lumen Maintenance***

Switching Cycle	3.5hrs on 0.5hrs off
Lamp Lift Time	6 months from date of production documented by monthly production code
Lamp Life	Lamp output >50% of initial lumen output

- ***Duty Cycle***

DC Current to Lmap Percent	+/- 0.5%

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- ***Rise Time***

Rise time to 80% of the stabilized luminous output is <90 seconds without forced convection. Extensive cooling of the bulb during lamp run-up phase may extend rise time significantly.

- ***Hot Restrike***

If the unit has been off for more than 60 seconds, the lamp must restrike.
(Ignition Voltage : 16KV +/- 3KV)
Thermal : Fans may stay on after lamp has been switched off.

- ***Temperature***

Lamp Driver Ambient Temp.	< 50°C, forced air cooling
Lamp Driver is thermally protected.	
Lamp Central Connector Max. Temp.	= 200°C
Lamp Burner Center of Moly Wire/Ni-bar weld	< 400°C
Lamp Burner Moly-foil	< 350°C

Validation of max. permissible temperatures by reference thermocouple measurement based on a reference lamp housing.

- ***Environmental Requirements of Lamp and Driver in Projection System***

Ambient Temperature	Operating:	10°C to 40°C
	Non-operating :	-20°C to 70°C
Humidity	Operating :	5% to 95% relative non-condensing
	Non-operating :	5% to 95% relative non-condensing
Altitude	Operating:	Max. 10000ft (3000m) @40°C
	Non-opearting :	Max. 40000ft @70°C
Vibration	Operating:	Random, standalone 0.015 g2/Hz 5Hz to 1000Hz, all primary axis, 30 minutes per orientation
	Non-operating :	Sine, standalone Q <= 5 1G control, 5Hz to 500Hz, all three primary axis, 5 minutes sweep rate
Shock	Non-operating :	Standalone 50g 11ms half sine pulse, all primary axis, three shocks per orientation

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CHAPTER 8

FUNCTION TEST AND ALIGNMENT PROCEDURE

This chapter provides equipment, conditions, patterns, and procedure needed for Function Test and Alignment. It also includes compatible modes. All information is for your reference.

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8-1 TEST EQUIPMENT NEEDED

- IBM PC with SVGA resolution (Color Video Signal & Pattern Generator)
- VCR with Multi-system(NTSC/PAL/SECAM)
- Chroma meter Minolta CL-100
- Hi-Pot machine

8-2 TEST CONDITION

- Circumstance Brightness : Dark room less than 60 lux
- Inspection Distance : 2.0m
- Screen Size : 60 inches diagonal (wide)
- Before function test and alignment, each PJ875 should be run-in and warmed-up for at least 30mins with following conditions.
  - In room temperature
  - With cycled display colors (R,G,B,White)
  - With cycled display modes
    640*350 (H=31.5 KHz, V=70 Hz)
    640*400 (H=31.5 KHz, V=70 Hz)
    640*480 (H=37.5 KHz, V=75 Hz)
    720*400 (H=31.5 KHz, V=70 Hz)
    800*600 (H=53.7 KHz, V=85 Hz)
    800*600 (H=37.9 KHz, V=60 Hz)
    1024*768 (H=48.4 KHz, V=60 Hz)
    1024*768 (H=68.7 KHz, V=85 Hz)
- Test Display Mode & Pattern (Refer to 8-3.1 & 8-3.2)
- Function Test and Alignment Procedure

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8-3 Test Display Modes and Patterns

8-3.1 Compatible Modes

Mode	Resolution	Horizontal Sync. (KHz)	Vertical Sync. (Hz)
VGA (Expanded)	640*350	31.5	70
	640*350	37.9	85
	640*400	31.5	70
	640*400	37.9	85
	720*400	31.5	70
	720*400	37.9	85
	640*480	31.5	60
	640*480	37.9	72
	640*480	37.5	75
	640*480	43.3	85
SVGA (Native)	800*600	35.1	56
	800*600	37.9	60
	800*600	48.1	72
	800*600	46.9	75
	800*600	53.7	85
XGA (Compressed)	1024*768	35.5	43 (Int) 0
	1024*768	48.4	60
	1024*768	56.5	70
	1024*768	60.0	75
	1024*768	68.7	85
Mac 13" (Expanded)	640*480	34.98	66.66
MacII 13" (Expanded)	640*480	35.0	66.68
Mac 16" (Truncated)	832*624	49.725	74.55
Mac 19" (Compressed)	1024*768	60.24	75
PC 98 (Expanded)	640*400	24.83	56.42
	640*480	31.5	70
	640*480	31.5	60
FM Towns (Expanded)	640*480	24.37	55.37
	640*480	31.5	60

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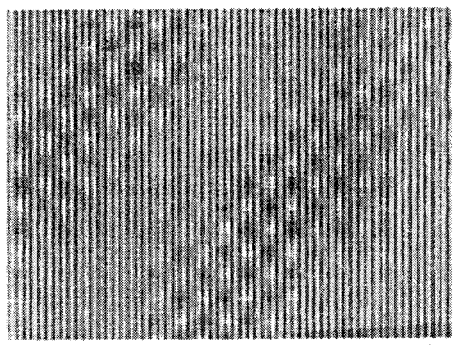
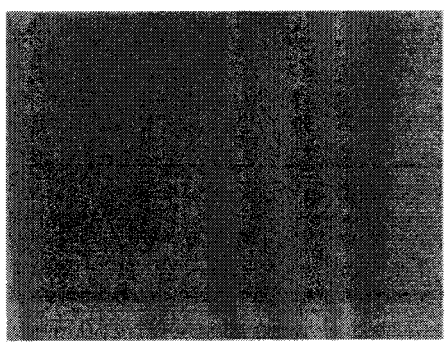
8-3.2 Function Test Display Pattern

Item	Test Content	Pattern	Specification	Remark
1	Frequency & Tracking	Fine Line Moire	Eliminate visual wavy noise.	Figure 1
2	Contrast/Brightness	Gray Scale	Gray levels should be distinguishable.	Figure 2
3	R, G, B and White Color Performance	R, G, B and White Color	Each R, G, B color should be normal.	Figure 3~6
4	Screen Uniformity & Flicker	Full White	Should be compliant with the spec.	Figure 6
5	Dead/Blemish Pixel	R, G, B, White, Dark, Blue 180, Gray 30	The numbers of dead/blemish pixels should be compliant with the spec.	Figure 3~9
6	Boundary	Boundary Frame	Horz. and Vert. position of video shuld be adjustable to be within the screen frame.	Figure 10

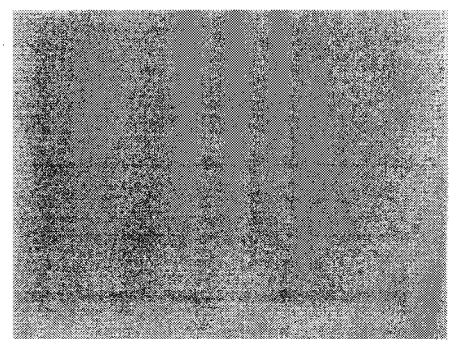


Fine Line Morie Pattern (Figure 1)

Contrast & Brightness (Figure 2)



R. Color Pattern (Figure 3)



G. Color Pattern (Figure 4)

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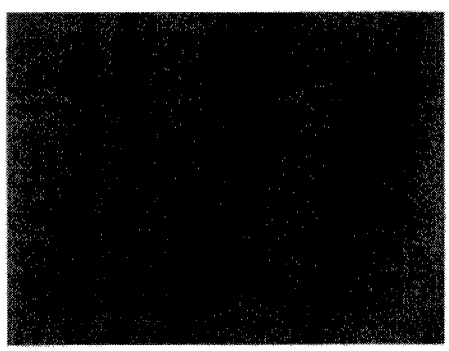
B. Color Pattern (Figure 5)

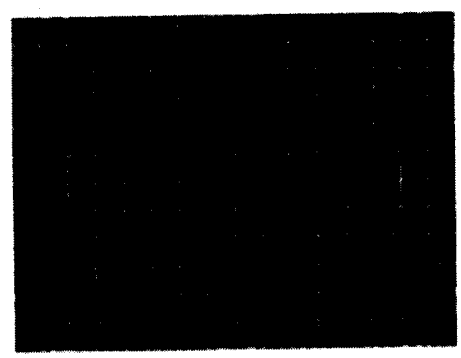
Full White Pattern (Figure 6)

Dark Pattern (Figure 7)

Gary 30 Pattern (Figure 8)



Blue 180 Pattern (Figure 9)



Boundary Frame (Figure 10)

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8-4 INSPECTION PROCEDURE

1) Hi-Pot Test :

Hi-Pot Specification : 1.5KVAC, 10mA, 2 seconds.

2) Noise Test :

Incline 30° to the left and right to check whether there is strange noise.

3) Function Test I :

(a). Connect PC, Video, S-Video, Audio signal and extension speaker with PJ875.

(b). Press source button to switch to PC signal.

- ◆ Make sure the image is normal.

(c). Press Pip button on the remote controller.

- ◆ Make sure the video signal appears on PC signal.

(d). Press Pip button to cancel Pip function.

(e). Press source button to switch to Video signal.

- ◆ Make sure the image is normal.

(f). Press source button to switch to S-Video signal.

- ◆ Make sure the image is normal.

(g). Press Menu button for 4 times to enter Audio Function OSD.

- ◆ Select Volume function and make sure the function works normally.
- ◆ Select Mute function and make sure the function works normally.
- ◆ Select Stereo/Mono function and make sure the function works normally.

(h). Disconnect the extension speaker.

- ◆ Make sure the internal speaker works normally.

4) Function Test II :

(a). Connect PC signal with PJ875.

- ⇨ Fine Line Morie Pattern :
  - Make sure the noise can be eliminated by Tracking function.
  - If there is line bar appearing, make sure it can be eliminated by Frequency function.
- ⇨ Boundary Frame Pattern :
  - Make sure the boundary can be displayed.
- ⇨ Press Menu button to enter Display Function OSD :
  - Make sure Keystone function works properly.

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- Press Menu button to enter Image function :
  - To select Auto image ON and make sure there is no noise occurring.
- Press Menu button to enter Projection function :
  - Select Front Ceiling function and press Enter button.
    Make sure the image is upside-down.
  - Select Rear Ceiling function and press Enter button.
    Make sure the image is up-down and left-right reversed.
  - Select Rear Desktop function and press Enter button.
    Make sure the image is left-right reversed.
  - Select Front Desktop function and press Enter button.
    Make sure the image is normal.
- Press Zoom In and Zoom Out buttons on the remote controller :
  - Make sure the image can be scaled up and down.
- Dark/ R/ G/ B Pattern :
  - Make sure the number of dot defect is compliant with the specification.
- Blue 180 Pattern :
  - Make sure there is no any dark blemish dot.
- Gray 30 Pattern :
  - Make sure there is no any bright blemish dot.

5) Function Test III :

(Please note : this function test only be used when you replace a new lamp.)

- Full White Pattern :
  - Measure the luminance at the center of image. It should be above 550 ANSI Lumen.

- Press ↑ ↑ ← (up, up, left) buttons on Optoma logo pattern (no signal) to enter Service OSD :
  - Select Factory set and press Enter button to zero the lamp life.

6) Outward Inspection :

- Scratch :
  - Width ≤ 0.2mm
  - Length ≤ 2.5mm

CHAPTER 9

FIRMWARE UPGRADE PROCEDURE

This Chapter provides the equipment needed, setup and upgrading procedure for Firmware upgrade. All the information is for your reference.

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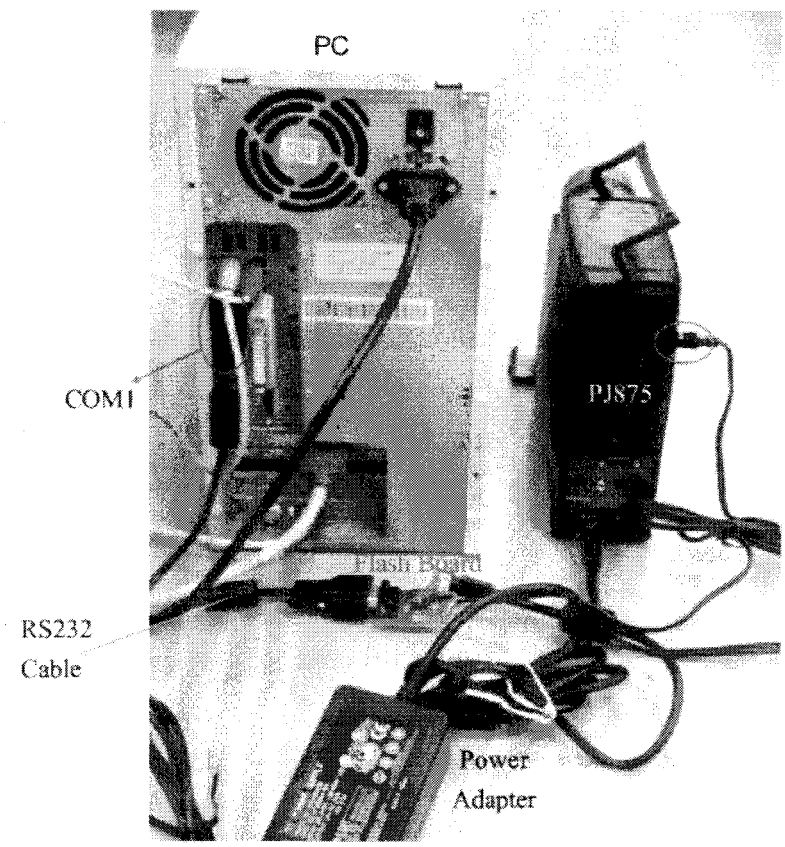
9-1 Equipment Needed

- ***Hardware :***
  - Flash Board
  - RS232 Cable
  - Power Adapter (with power cord)
  - PC (Personal Computer)
  - PJ875
- ***Software :***
  - FlashUpgrader.exe
  - Flasher.hex
  - PJ875.hex
  - Pj875.inf

9-2 Setup Procedure

1. Connect COM1 of PC and Flash Board with RS232 cable.
2. Connect Power Adapter to Flash Board.
3. Connect Flash Board to the Projector (PJ875).



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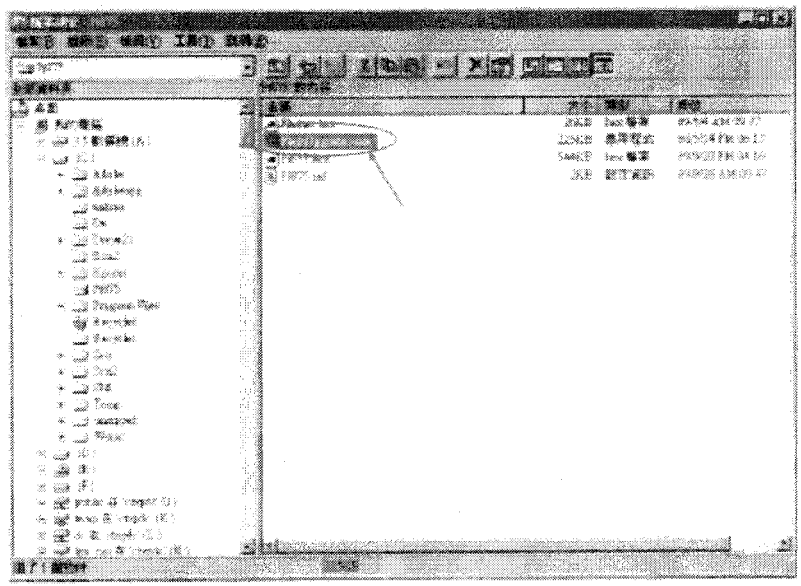
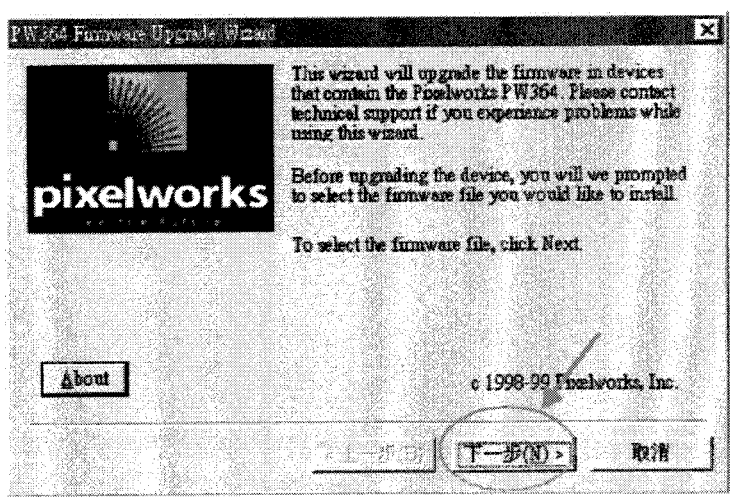
9-3 UPGRADE PROCEDURE

1. Execute <FlashUpgrader.exe> program.



2. Click "Next" icon.


PW364 Firmware Upgrade Wizard
pixelworks
This wizard will upgrade the firmware in devices that contain the Pixelworks PW364. Please contact technical support if you experience problems while using this wizard.
Before upgrading the device, you will we prompted to select the firmware file you would like to install.
To select the firmware file, click Next.
About
c 1998-99 Pixelworks, Inc.
下一步(N) >
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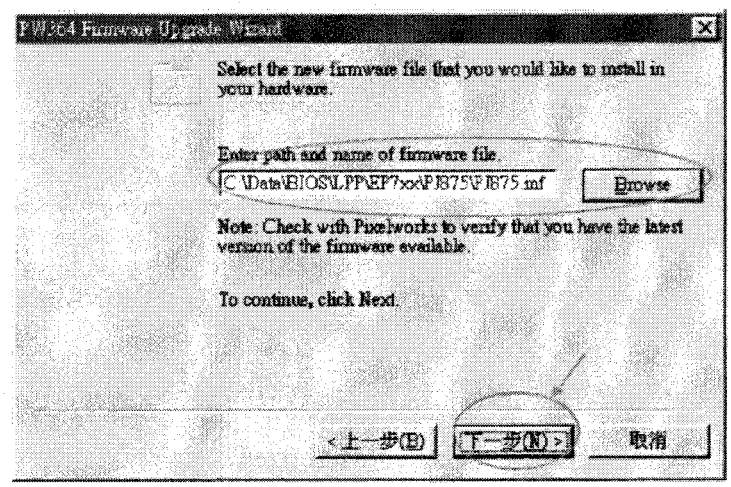
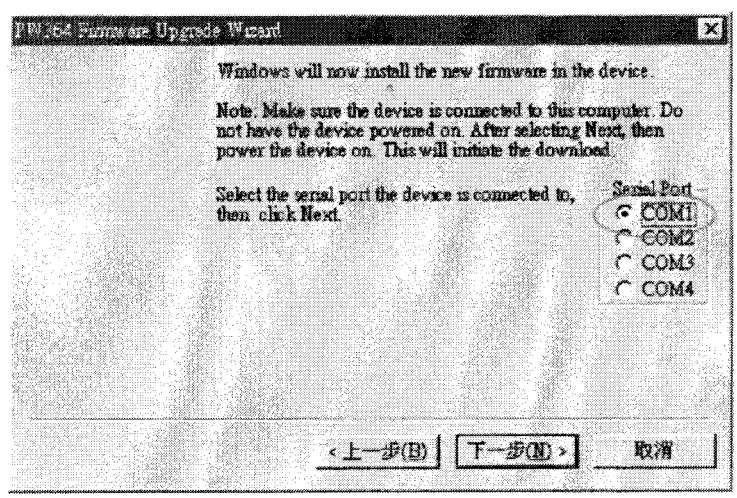
3. Click "Browse" icon to choose the path of <PJ875.inf>, then click "Next" icon.


PW364 Firmware Upgrade Wizard
Select the new firmware file that you would like to install in your hardware.
Enter path and name of firmware file.
C:\Data\BIOS\LPP\EP7xx\PJ875\PJ875.inf
Browse
Note: Check with Pixelworks to verify that you have the latest version of the firmware available.
To continue, click Next.
< 上一步(B)
下一步(N) >
取消

4. Select the serial port which the device is connected to, then click "Next" icon.


PW364 Firmware Upgrade Wizard
Windows will now install the new firmware in the device.
Note: Make sure the device is connected to this computer. Do not have the device powered on. After selecting Next, then power the device on. This will initiate the download.
Select the serial port the device is connected to, then click Next.
Serial Port
COM1
COM2
COM3
COM4
< 上一步(B)
下一步(N) >
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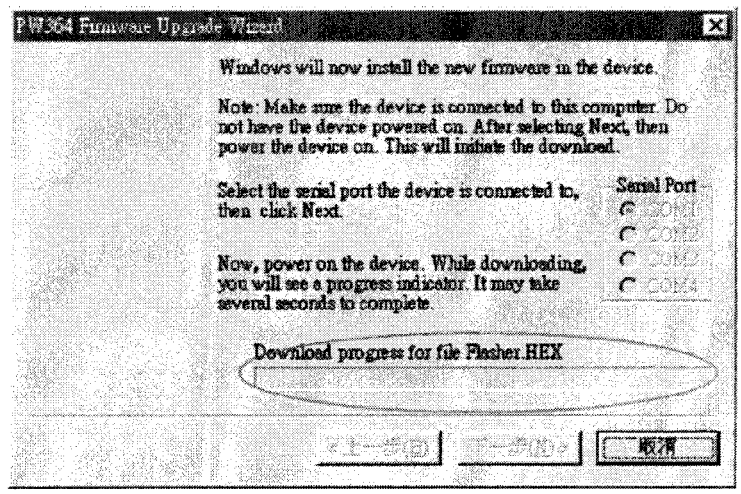
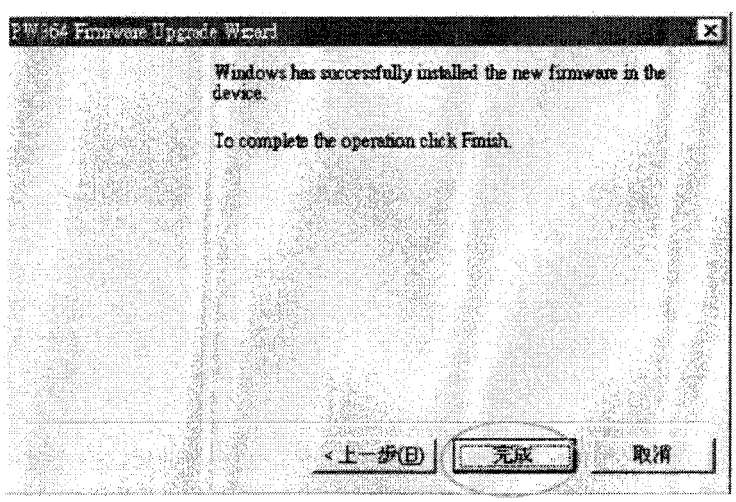
5. After the following screen and message of "Download progress for file Flasher.HEX" appear, plug Power Cord into PJ875. And PJ875 will be under upgrading.


PW364 Firmware Upgrade Wizard
Windows will now install the new firmware in the device.
Note: Make sure the device is connected to this computer. Do not have the device powered on. After selecting Next, then power the device on. This will initiate the download.
Select the serial port the device is connected to, then click Next.
Serial Port
COM1
COM2
COM3
COM4
Now, power on the device. While downloading, you will see a progress indicator. It may take several seconds to complete.
Download progress for file Flasher.HEX
取消

6. Plug in power cord and then power on the projector. It'll take several seconds to complete Firmware upgrading. Click "Finish" icon to complete the operation.


PW364 Firmware Upgrade Wizard
Windows has successfully installed the new firmware in the device.
To complete the operation click Finish.
< 上一步(B)
完成
取消

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CHAPTER 10
APPENDIX

10-1 SERIAL NUMBER FORMAT

PPP YY WW xxxxx
① ② ③ ④

① : Regional Product ID Code (B0C = PJ875)
② : YY = Last two digits of manufacturing year (ex: 1999 - 99, 2000 - 00)
③ : WW = Manufacturing week
④ : xxxxx = Sequence number

EX: B0C005000427

This label "B0A005000427" represents the whole serial number for PJ875. It's produced on 50-week of 2000 and its sequence number is 00427.

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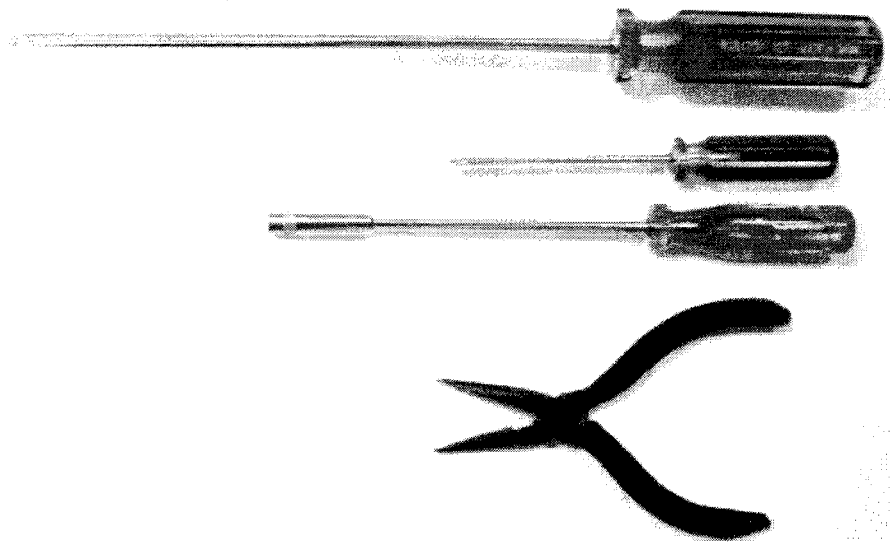
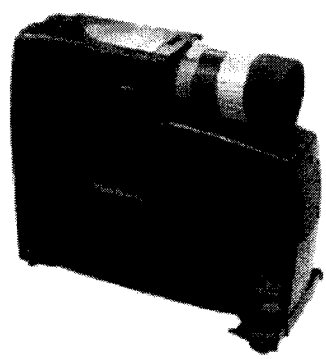
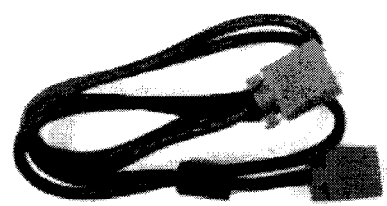
10-2 EQUIPMENT ILLUSTRATION



From top to bottom :
1. Philips Screw Drivers (Size : 107 & 101)
2. Hexagon Nut Spinner (Size : 5mm)
3. Nose pliers



PJ875



VGA Cable

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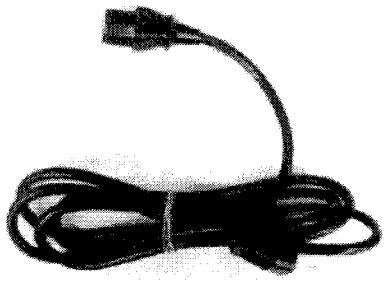
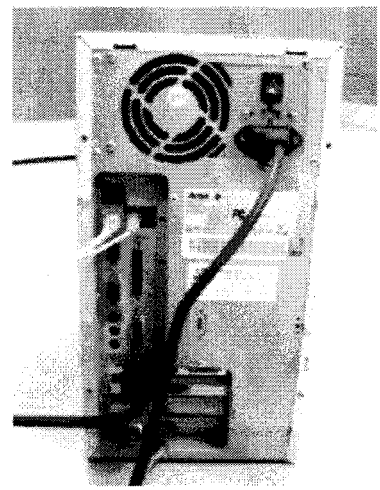
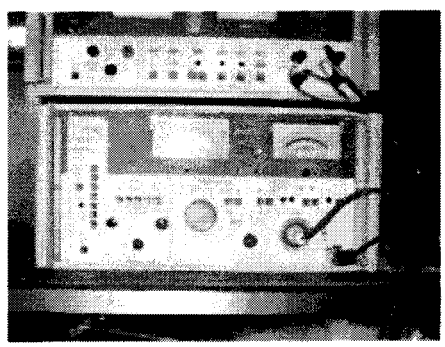


Power Cord

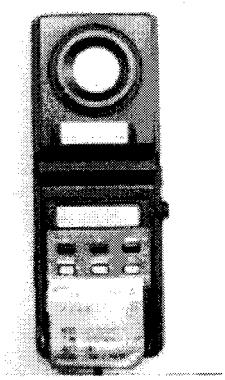


PC (Personal Computer)



Hi-Pot

VCR with Multi-system (NTSC/PAL/SECAM)

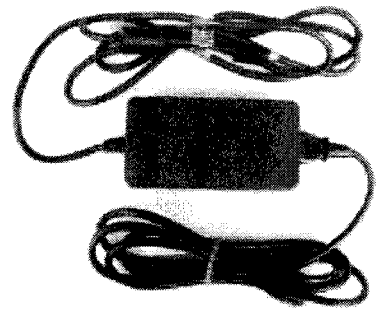


Chroma meter Minolta CL-100

Flash Board

Confidential - Do Not Copy

RS232 Cable



Power Adapter with Power Cord

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